OCTOBER 5, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Economy's Convalescence After Steel Strike Will Be Rougher than Walkout

Nicaro: What the Buyer Will Get

A Boom in Corporate Aid to Education: How to Figure Your Fair Share

Nylon Solves Fabrication Problems

Hot Dies Aid Forging

Component Stocks Are Adequate–Now

Office Productivity: How to Foster It

You spend 40 per cent of your sales dollar on organization and policy matters—if you're a typical manufacturer. So consider the potential you have for cutting costs in this area. The payoff on your improvement work can be as great as 8 to 1, a Westinghouse department found. For tips, see Page 50.

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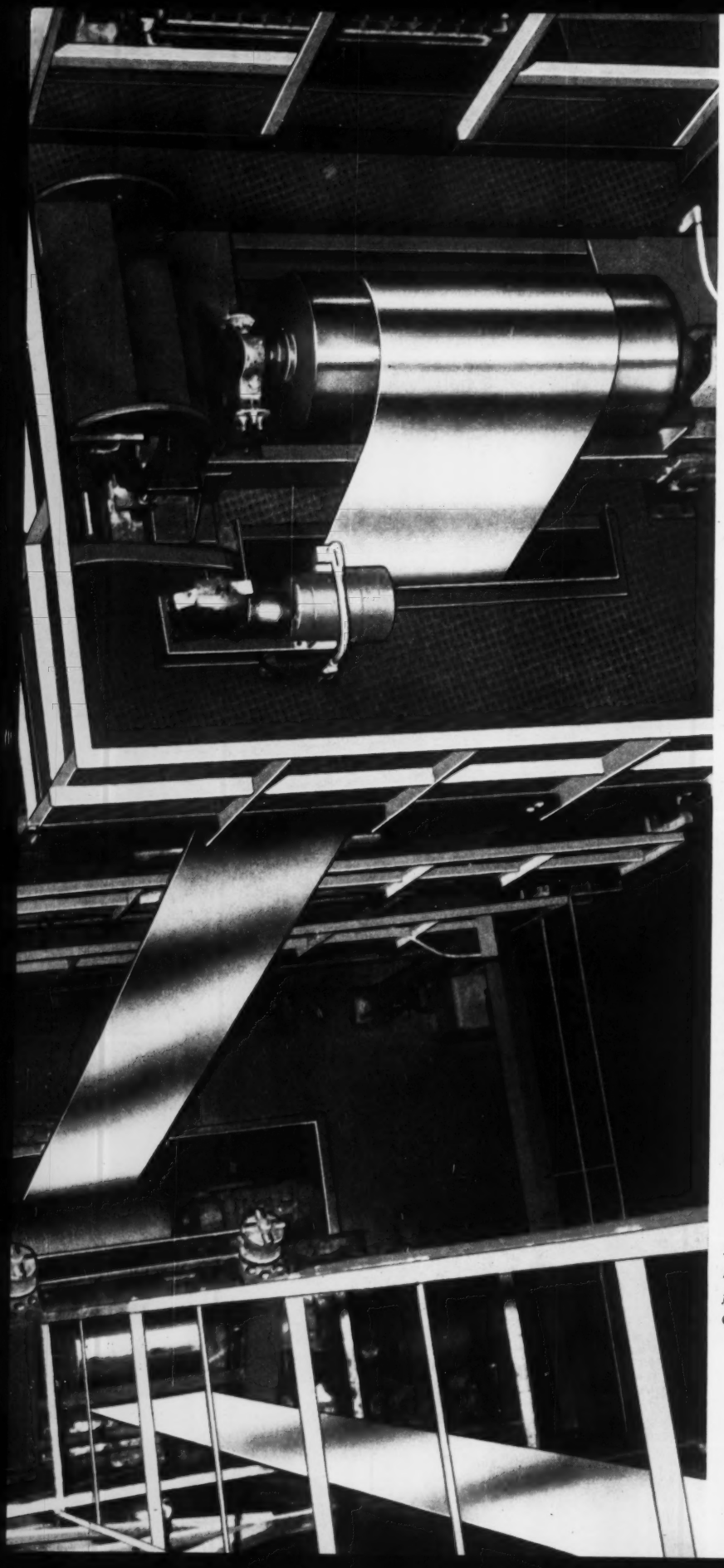

LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

The equipment must be heavy and rugged. High speeds with lower tensions in annealing, tinning and recoiling can only be accomplished with rugged equipment. Reels, both pay-off and tension, must be heavier to accommodate the bigger coils. New electrical controls are only practical when applied to sturdy mechanical equipment. Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

BLAW-KNOX COMPANY
AETNA-STANDARD DIVISION
FRICK BUILDING · PITTSBURGH, PENNSYLVANIA

57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip

This Week in STEEL

The Metalworking Weekly

October 5, 1959 Vol. 145—No. 14

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED SEPT. 26	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	113†	111	111	139

†Preliminary.

A strong seasonal rise in auto output and stability in electricity output, freight carloadings, and steel production marked the industrial business trend in the latest week. That pattern will continue until the steel strike ends.

Details on Page 67

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED OCT. 3	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	115,000*	88,906†	17,261	34,464

*Estimated. †Preliminary.

So far, the steel strike has not affected the new model buildup in Motordom. While some parts plants are down, the producers have enough inventory of components to maintain an orderly uptrend for several weeks.

Details on Page 64

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED OCT. 4	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	368*	262	332	1,901
Index (1947-49=100)	22.9*	22.5	20.7	118.3
Percentage of capacity	13.0*	12.8	11.7	70.4

*Estimated by STEEL; comparative figures reported by AISI.

Steel mills which are not strikebound lifted production last week to the highest level attained since the walkout started. That is about 13 per cent of the industry's capacity and is about maximum for the strike period.

Details on Page 138

STEEL SCRAP PRICE COMPOSITE

	SEPT. 30	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$43.00	$41.00	$39.00	$43.00

Scrap prices rose sharply last week. The market was stimulated by continued heavy export demand, a shrinking in industrial scrap supplies due to tapering in finished steel stocks, and prospects for a high rate of consumption when mills reopen.

Details on Page 151

FINISHED STEEL PRICE INDEX

	SEPT. 29	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	186.6

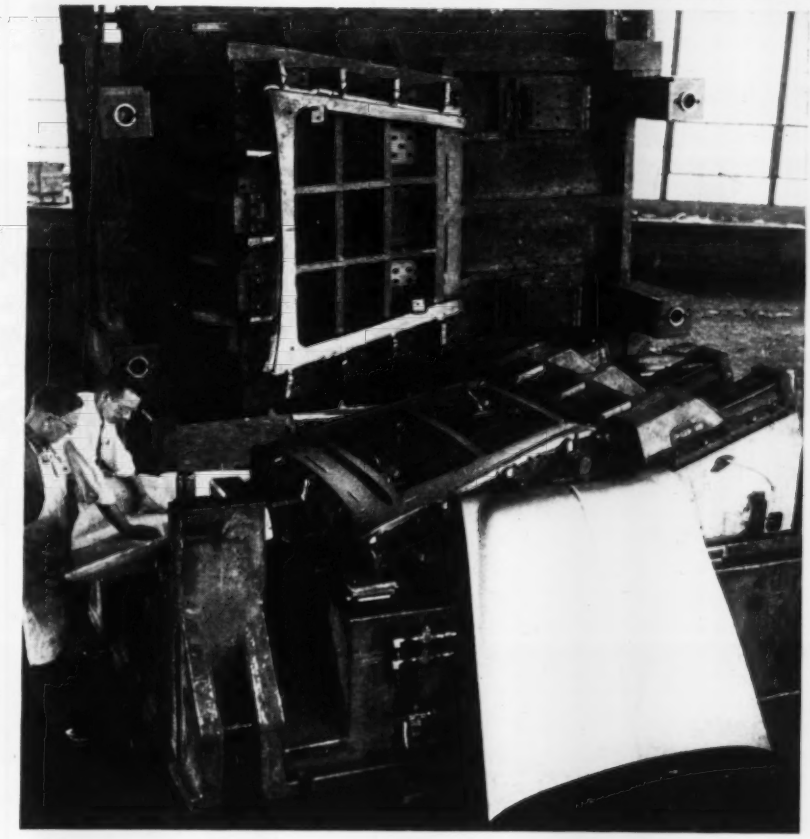
Steel producers are expected to revise their galvanized steel product prices to reflect the recent advance in zinc quotations. It is an automatic action, but actual delivered prices will depend on the ruling zinc price at time of shipment.

Details on Page 139

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



Automotive Die, in 101 Sections, Made from Water-Hardening Steel

This huge die, made up of Bethlehem W-1 carbon water-hardening tool steel, trims an automobile hood. Made from tool steel furnished by Peninsular Steel Co., Detroit, the die was photographed recently at Republic Die & Tool Company, Wayne, Mich. It contains 44 composite sections, 34 wear plates, and 23 solid sections.

Bethlehem carbon water-hardening steels were selected for this exacting application because of their good wear-resistance, easy machinability, and simple heat-treatment—plus ease of welding should repair become necessary.

Bethlehem carbon water-hardening tool steels, because of their carefully controlled hardenability, provide economical service in applications calling for high shock-resistance. And with their highly selective carbon range, they have good resistance to wear, plus the toughness to withstand cold battering.

If you have any questions about the use of Bethlehem carbon water-hardening tool steel, or any of our other popular grades, get in touch with your Bethlehem tool steel distributor. He's as near as your telephone.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Here's How to Stabilize Gages

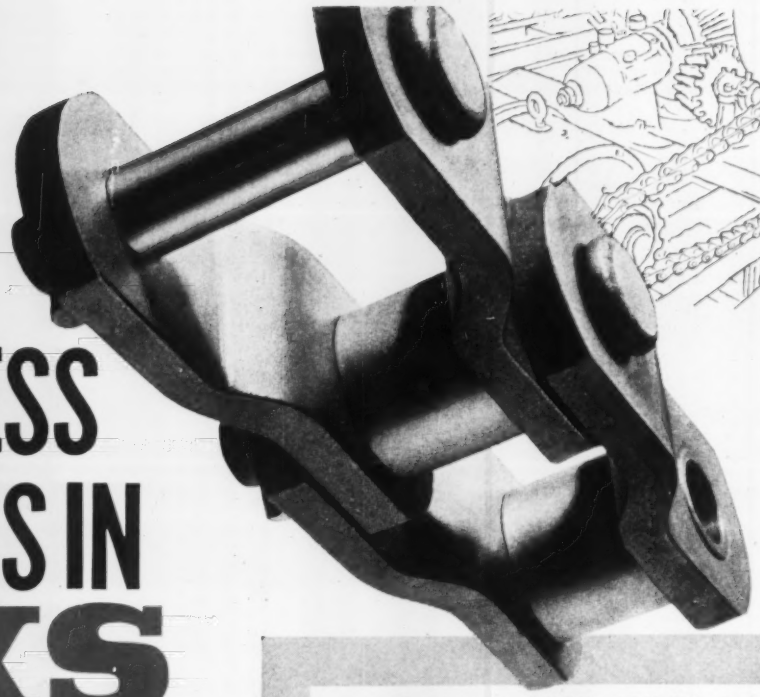
High-precision gages, commonly made of BTR tool steel (AISI Type 01), need a stabilization treatment if they are to maintain their accuracy for years. Otherwise expansion will eventually change dimensions outside of the permissible tolerance. These dimensional changes are in a magnitude of hundred-thousandths of an inch per inch, or smaller. Insignificant on ordinary tooling, they are important on precision gages.

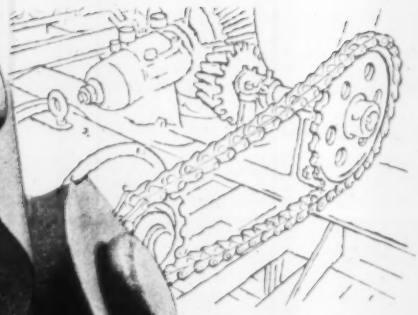
The expansion which occurs over a period of time is due to the transformation of austenite retained during the quench for hardening. The object of the stabilization treatments is to transform the retained austenite during the treatment, so that none remains which could transform later on. This condition exists in all tool steel grades which can be hardened to Rockwell C 60 or higher.

The most common method for stabilizing high-precision BTR gages is: 1. Quench and temper in the normal manner to produce the desired hardness. 2. Rough grind. 3. Subzero cool to minus 100/120 F in refrigerator or dry ice. 4. Warm to room temperature and then retemper at original temperature. 5. Finish grind to size. 6. Repeat cycles of subzero cool followed by tempering five more times. 7. Lap or superfinish to size.

Sometimes it is possible to shorten this procedure, particularly if the design is such that there is little hazard of cracking. For example, the tools can be subzero cooled directly from the quench, with no interval at room temperature, followed by tempering and grinding. This will permit stabilization with only two additional cycles of subzero cool plus temper, but the disadvantage is that cracking may occur after quenching.

It is also possible to shorten the stabilization by cooling to minus 314 F in liquid air. This permits reducing the cycles of subzero cool plus temper to three instead of six.





FAR LESS STRESS IN LXS

THE CHAIN WITH NO "STRESS RAISERS"!

Link-Belt LXS brings long-term economy and efficiency to the most punishing drive and conveying jobs. With its "FULL-ROUND" design, LXS has no stress-concentration points . . . none of the sharp corners which frequently shorten the life of many ordinary chains.

LXS is available with straight or offset sidebars. For details, contact your nearest Link-Belt office or authorized stock-carrying distributor. (See CHAINS in the yellow pages of your phone book.) Ask for our new, comprehensive Catalog 1050.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15.063

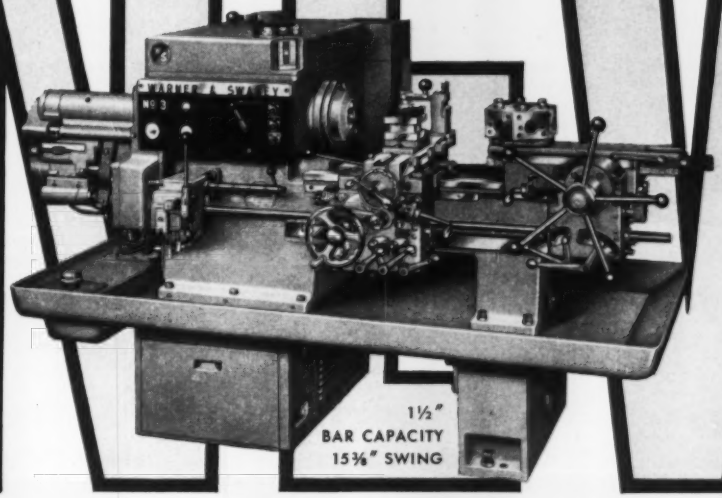
They're all of "FULL-ROUND" design

PINS BUSHINGS SIDEBARS

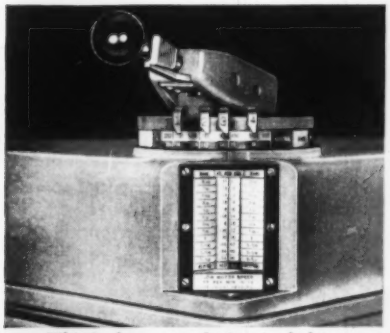
"FULL-ROUND" design eliminates traditional stress concentration points in Link-Belt LXS . . . provides maximum live bearing area between pins and bushings. Result: stress is distributed evenly.

Other LXS long-life features include controlled press fits plus use of selected steels and controlled hardening of all parts. All this contributes to greater uniformity, greater endurance.

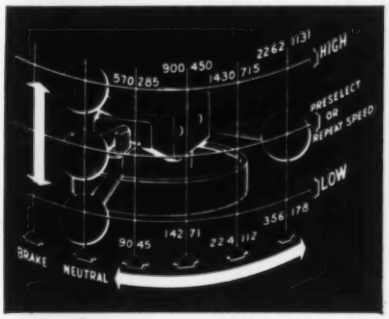
NEW



WARNER & SWASEY No. 3 ram type turret lathe



This is the new exclusive single lever headstock control...



This is how easy it is to operate

Unique, Automatic Headstock

More Speeds—Greater Range—The new eight-speed headstock (16 with a two-speed motor) gives you more speeds in a wider range—from 45 to 2262 rpm—for maximum metal removal efficiency.

Instant Speed Changes are made possible through exclusive, Warner & Swasey designed direct-acting hydraulic clutches (which never need adjustment) in combination with a constant mesh, helical gear train.

Full Power is always available at the spindle nose. Higher-powered motor is direct-mounted to eliminate drive maintenance problems.

Exclusive, Single Lever Preselector and Speed Control

On the new No. 3, preselection of speeds, speed change, brake and neutral are all obtained with the same lever.

No fumbling for speeds... no gear shifting. Just rotate the handle to preselect; move it up or down to engage new speed instantly.

No figuring... the direct reading preselector dial tells you the surface speed for each diameter and rpm.

No remembering (or forgetting)... the preselector drum lets you set up the sequence of cuts; numbered clips tell you where to find the speeds and their order of use.

Neutral (free spindle) and Brake are selected by rotating lever to the left.

Warner & Swasey Co.
Cleveland 3, Ohio

You can produce it better, faster, for less...with a WARNER & SWASEY

32 Clevelands keep 450-ton ladle cranes on the job at Geneva Works

Moving big tonnage up and down, forward, backward and sideways is all in a day's work for 32 Cleveland built-in drives installed on the bridge and hoist of these 450-ton ladle cranes. These and many other Cleveland Worm Gear Drives and Speed Reducers can be found throughout the mill driving pushers, levelers, edgers, conveyors and other cranes.

Because of their established "long-life" service records, Cleveland drives are recognized leaders for keeping maintenance and replacement costs to the absolute minimum. Contact a Cleveland Field Engineer, or write for Bulletin 145 describing how Cleveland Worm Gear Drives solve tough production problems and reduce maintenance costs.

The Cleveland Worm & Gear Company
3270 East 80th St., Cleveland 4, Ohio

Subsidiary of
Eaton Manufacturing Company

Affiliate: The Farval Corporation

CLEVELAND
Worm Gear
Drives

STEEL
Servicenter

Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

October 5, 1959

'Down With Gutenberg!'

That's a chapter title in American Management Association's new book, *The Embattled Executive.* Using reverse English, its rib tickling cartoons highlight the humorous side of the executive's job.

Here's the caption for the cartoon above: "Wall of Words—The reading problem here is not the reader's, but his company's. He keeps so busy keeping informed that he has no time to make decisions or perform other disagreeable chores."

Makes Fasteners Fascinating

The AMA's view that humor helps businessmen is underscored by this squib received by Assistant Editor Mary Borgerhoff.

For the second consecutive year, the direct mail advertising program of Albany Products Co. Inc., South Norwalk, Conn., has been selected the outstanding campaign of the year by the Direct Mail Advertisers' Association. Nuts and bolts—a byword in advertising for stodgy copy, was given this wry fillip by the fastener distributing firm:

"Roses are red,
Violets are blue;
We love to sell
NUTS TO YOU!"

Case in Point

Editors well know the volume of reading matter that faces embattled executives, and we strive to keep things to minimum. Here's an example. A while back, Washington Editor Jack Botzum wrote a "Windows of Washington" column about James H. Sands, executive vice president, Eclipse Fuel Engineering Co., Rockford, Ill. It took Jack a mere 64 lines and a photo to spell out the valuable contributions made by Mr. Sands and his fellow WOCs (people who work without compensation for the U. S. government).

A month later, Mr. Sands was given a well deserved tribute in the halls of Congress by Sen. Everett M. Dirksen (R., Ill.). It was recorded in the *Congressional Record*, a sheet noted for minuscule print that causes owners of 20-20 vision to trombone the pages for proper focus.

A word count comparison shows that Senator Dirksen used twice as many words as Jack. Yet the knowledge communicated in both pieces was nearly the same.

From that bit of arithmetic, we drew these conclusions: 1. Senators still talk a lot. 2. We covered more ground with half as much wordage. 3. We have a good copy editor in Harry Chandler. (He used a sharp pencil to cut Jack's copy.)

By the by. Harry is a lawyer, and contrary to the rule in legaldom, he believes in using the leastest words to convey the mostest.

The High and the Flighty

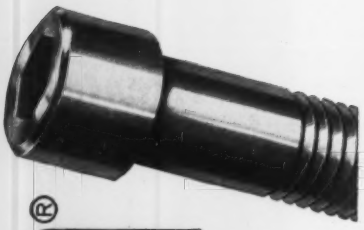
Detroit Editor Don Postma is about ready to take up shanks' mare as his mode of transportation. On an early morning flight to Cleveland, Don witnessed one of the plane's passengers hurrying to the cockpit door and begin flailing thereon with his fists. An engine drowned conversation ensued, with much gesturing and peering out of windows. One engine was leaking oil. The plane circled, landed at Detroit, and the passengers were taken to Cleveland aboard another plane.

That evening, Don arrived at the airline's ticket desk to report in for the 7 p.m. flight to Detroit. Seven o'clock came and went; no plane. At 7:20, the perplexed ticket agent phoned his company HQ and discovered that the flight had been canceled. No other airlines had seats open.

Don and the waiting passengers then dickered with a suburban air service for a chartered plane. The charter fee was less than the airline's price. At the agreed time, 8 p.m., no plane. Don called the charter service and was informed the price had gone up $20 because, after sunset, the pilot would only fly a twin engine job.

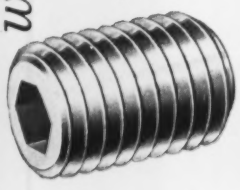
"A new form of airway robbery," muttered Don. He and the other strandees finally took off for Detroit at 9:30 p.m.

Don later learned that the 7 p.m. plane was



B-RIGHT-ON®
SOCKET SCREW PRODUCTS
1835 Reading Road
Cincinnati 2, Ohio

You can do better with...



out of service because that morning it had made an emergency landing in Canada with one engine aflame. Anyhow, Don, Detroit editors should do more driving.

A Real Mettle Tester

"Regarding your Servicenter comments on Ed Case, STEEL's new metallurgical editor—can we now assume that all who report to him are case hardened?" asks J. A. Sudick, production manager, Chain Belt Co., Los Angeles. "All kidding aside, we enjoy STEEL tremendously. How about more articles on explosive forming?"

Mr. Sudick, we don't know if people who report to Ed are case hardened, but Ed allows as how he was named after case hardening—about 200 years after.

We do have more articles scheduled on explosive forming. Associate Editor Ross Whitehead has a bulky file built up on this, the biggest bang in metalworking, and you'll be seeing an article or two on it in forthcoming issues.

Management in Transition

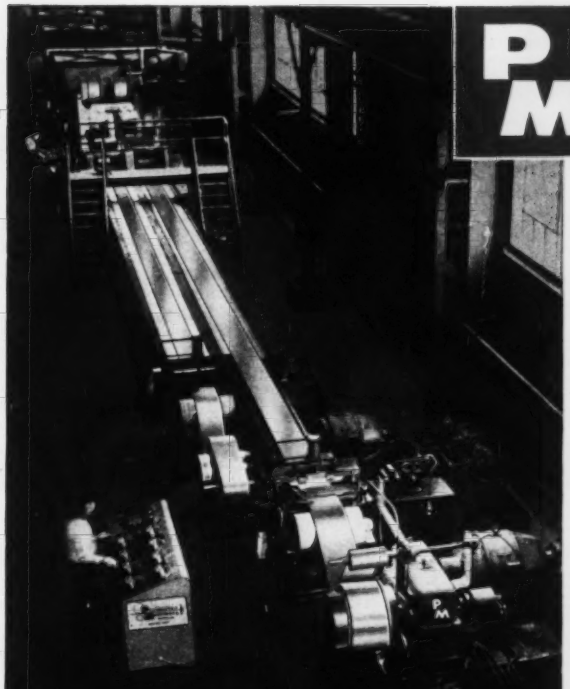
In the "good ole days" two top managers, with a couple of good boys, could run a plant successfully. Joe Engineer took care of manufacturing and Wally Salesman saw to customer needs. Each had his own job; each did it with minimum consultation or even assistance from the other.

But doing business became complex. Unions tossed in an oar that helped rile the waters . . . new legislation forced more tasks on management . . . new skills like marketing became important . . . competition got tougher and the old managers called on more and more specialists—the men in staff functions—to gain more efficient operations.

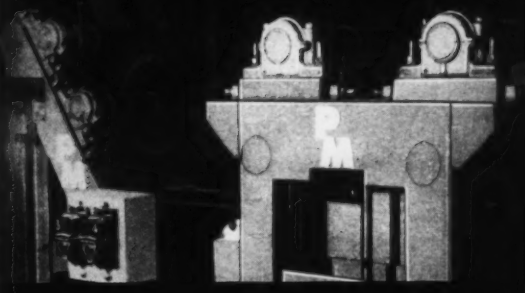
New headaches were created too. Staff functions could boost company efficiency—but only if well meshed with line functions. And there is the problem News Editor Bill Dean will tackle in next week's Program for Management article, "Management in Transition."

How're the staff-line relationships in your plant? Bill found few managers who wouldn't admit there's room (and need) for improvement. Some staff-line conflicts have roots in poor organization. Others stem from managers who are in jobs "over their heads." Many conflicts flourish because of poor human relations practices.

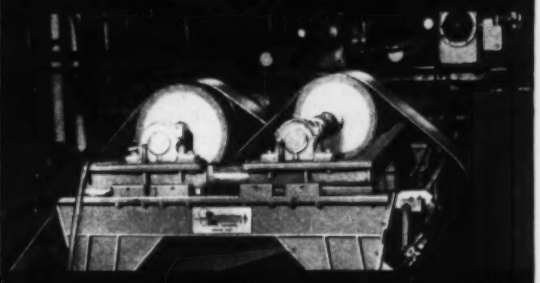
One vice president suggested that staff-line organization is outmoded and the word authority should be eliminated from all job descriptions. For more on this editorial look at staff-line functions, see STEEL next week.



Finish end of new PM 2-strand pickle line that improves output, quality for stainless steel producer. (Note evenness of coils on PM coilers.)



Separate, independent rolls for each strand have shafts mounted in anti-friction bearings outside pickle tanks away from corrosive fumes. This permits rolls to turn freely, so as to prevent scratching of stainless steel.



Greater wrap of stainless steel around idler support rolls, and special surface of roll covers, also insure free turning, non-scratching rolls to handle wet, slippery steel.

PM's "PRODUCTIONEERED EQUIPMENT"

Key to
- more output...
- better quality...
- improved operation

from this new pickle line

As an example of what PM's "productioneered equipment" can do for you, take one feature of a new PM pickle line recently installed for a major steel producer:

Previously, support rolls on continuous pickling lines processing stainless steel tended to mar the surface of the metal. Marks were produced when the idler rolls failed to turn as fast as the strip passing over them.

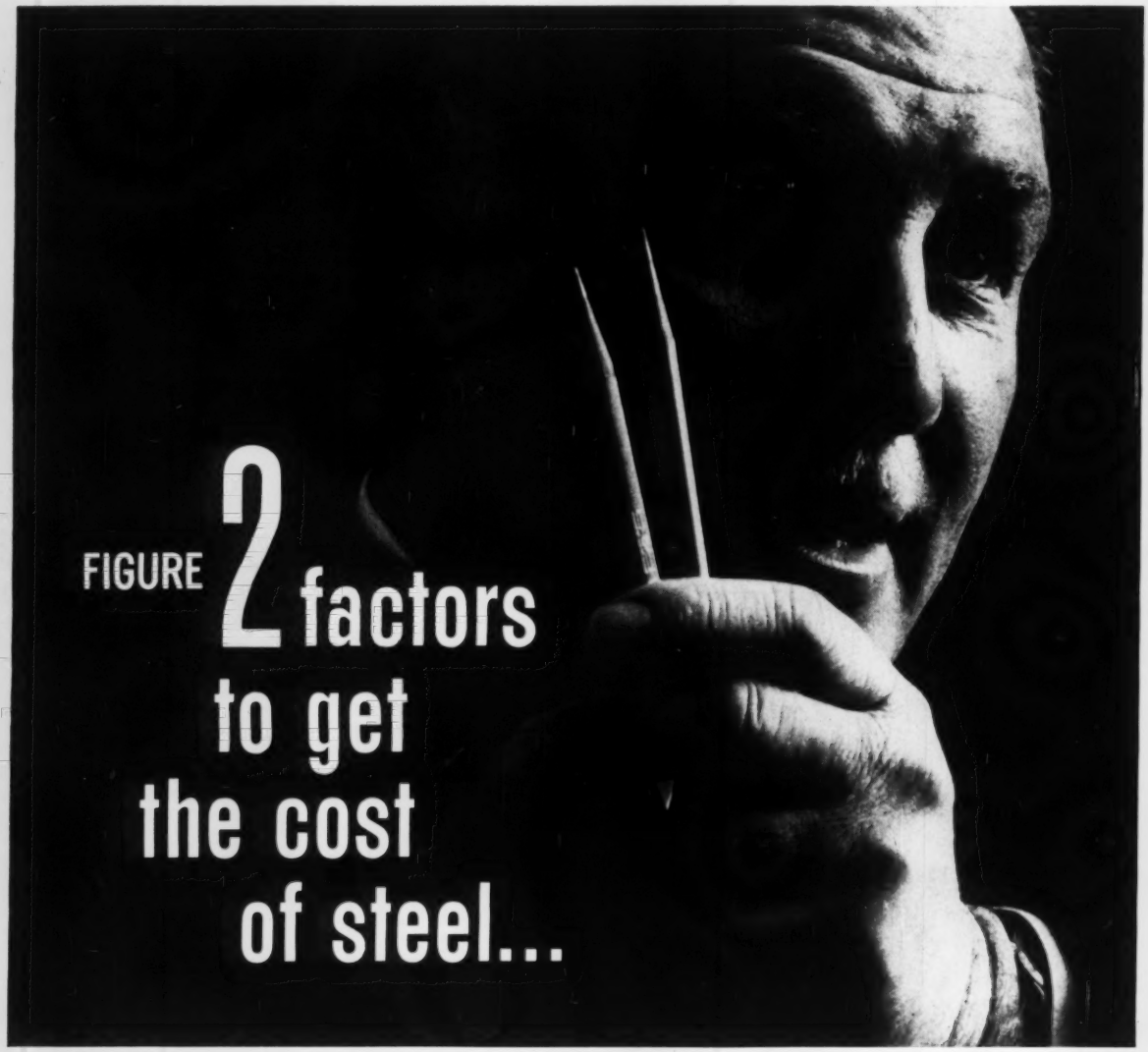
Because PM designers *understood* this problem, they were able to design the new pickle line with special bearings, provision for a greater degree of wrap of the steel around the rolls, special type of surface on the rubber covering, and other design details which insure the rolls turning at strip speed, so as to eliminate scratching of the stainless steel.

This and additional design refinements such as automatic strip tracking devices make this line capable of more usable output, with greater uniformity in product quality, and less trouble for operators.

Productioneering can solve tough production equipment problems for *you*, too. *Productioneering* is the PM way of working so engineers who supervise designing have first-hand knowledge of problems encountered by machinery owners. In working with PM, you work with responsible experienced engineers who apply their skill to solve your problems. PM's equipment recommendations suit your specific needs—that's why it pays to *call in a PM man* as soon as you start planning installation of any of the metal processing equipment listed below.

Production Machinery Corporation
Mentor, Ohio

Continuous strip pickling lines
Stainless steel processing equipment
Slitting lines
Shearing and cut-to-length lines
Vacuum and magnetic sheet feeders and pilers
Uncoilers, shears, pinch rolls, reels, and other special equipment



Price and the **COST OF POSSESSION!**

Take a look at the chart at the right. These are the additional items that determine your *total* cost of steel.

If you are buying more than three months' requirements, consider drawing on the inventory of your Steel Service Center. You'll get steel when you want it, delivered, cut-to-size, ready for production. Technical assistance is yours, too, if you need it.

If you're placing steel in inventory because you think it's a bargain, compare *all* of your costs, including *cost of possession*, with the price and *freedom from risk* of buying from your Steel Service Center.

Get the booklet, *What's Your Real Cost of Possession for Steel?* from your nearby Steel Service Center. Or write to American Steel Warehouse Association, Inc., 540-G Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL _____

AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

. . . YOUR STEEL SERVICE CENTER

Carl:
This sounds like what we've been looking for. Suggest your investigate
JC

COOPERATIVE CREATIVE-ENGINEERING

• COOPERATION IN IDEAS

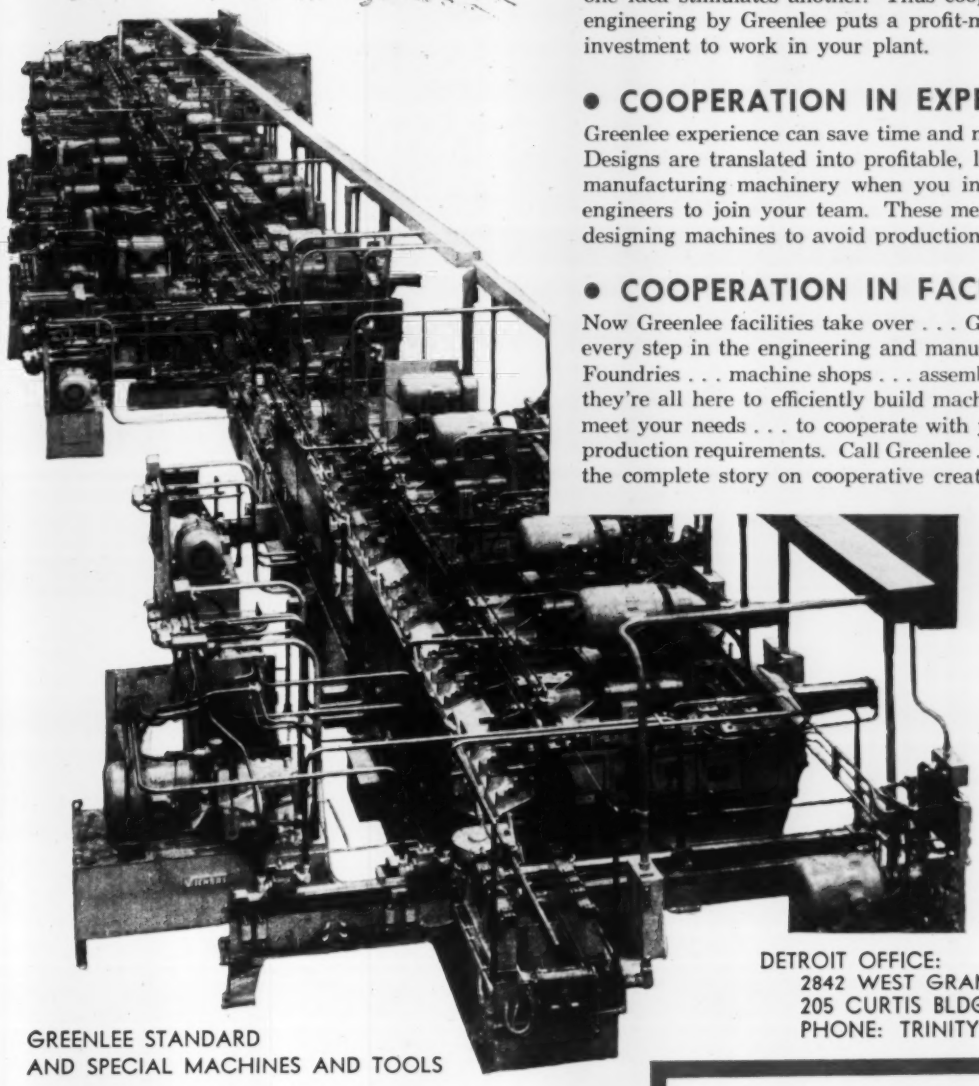
Greenlee engineers work with your men at all levels of management, production, and engineering. They gather and exchange information based on broad experience. These contacts accelerate creative thinking . . . one idea stimulates another. Thus cooperative creative-engineering by Greenlee puts a profit-making investment to work in your plant.

• COOPERATION IN EXPERIENCE

Greenlee experience can save time and money in your plant. Designs are translated into profitable, low-cost manufacturing machinery when you invite Greenlee engineers to join your team. These men know the art of designing machines to avoid production problems.

• COOPERATION IN FACILITIES

Now Greenlee facilities take over . . . Greenlee controls every step in the engineering and manufacture of machines. Foundries . . . machine shops . . . assembly floors . . . they're all here to efficiently build machines to meet your needs . . . to cooperate with you in meeting production requirements. Call Greenlee . . . let them give you the complete story on cooperative creative-engineering.



PRODUCTION MACHINERY
GREENLEE

Miss Jones:
write for available literature and mail this to Jo Thomson
CF

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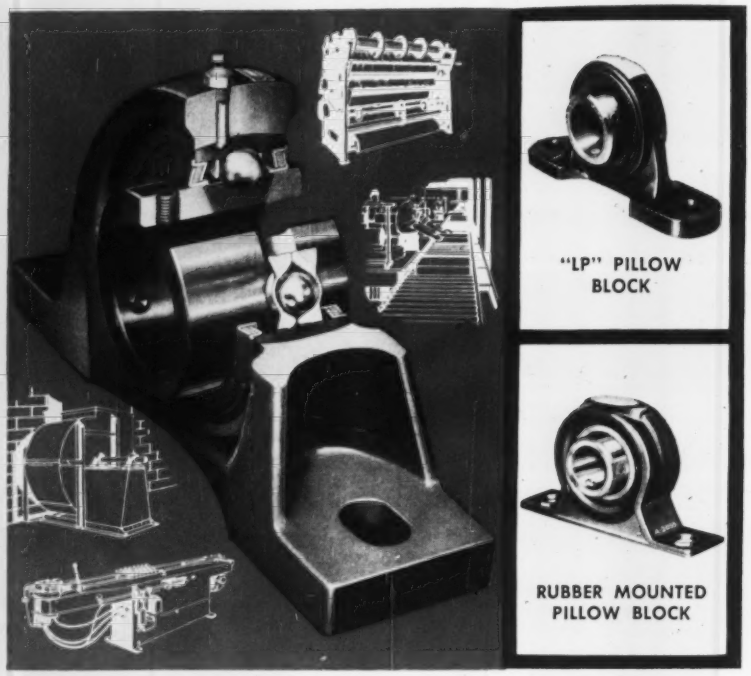

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Oct. 5-9, Society of Automotive Engineers: National aeronautic meeting, aircraft manufacturing forum, and engineering display, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Oct. 6-7, Powder Metallurgy Parts Manufacturers Association: Fall meeting, Sheraton-Cadillac Hotel, Detroit. Information: Hanson & Shea Inc., 1 Gateway Center, Pittsburgh 22, Pa.

Oct. 7-9, American Vacuum, Society Inc.: Symposium on vacuum technology, Sheraton Hotel, Philadelphia. Society's address: Box 1282, Boston 9, Mass. President: A. J. Gale.

Oct. 7-9, Gray Iron Founders' Society Inc.: Annual meeting, Fairmont Hotel, San Francisco. Society's address: 930 National City-E. 6th Bldg., Cleveland 14, Ohio. Executive vice president: Donald H. Workman.

Oct. 7-10, American Society of Tool Engineers: Semiannual meeting, Chase-Park Plaza Hotels, St. Louis. Society's address: 10700 Puritan Ave., Detroit 38, Mich. Executive secretary: Harry E. Conrad.

Oct. 10-13, Conveyor Equipment Manufacturers Association: Annual meeting, Grand Hotel, Point Clear, Ala. Association's address: 1 Thomas Circle, Washington 5, D. C. Executive vice president: R. C. Sollenberger.

Oct. 11-16, American Society for Testing Materials: Pacific area national meeting and exhibit, Sheraton-Palace Hotel, San Francisco. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Oct. 12-14, National Electronics Conference Inc.: Annual meeting and exhibit, Sherman Hotel, Chicago. Conference's address: 84 E. Randolph St., Chicago 1, Ill. Executive secretary: A. H. Streich.

Oct. 12-15, Wire Association: Annual meeting, Statler-Hilton Hotel, Cleveland. Association's address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

Oct. 15-17, Foundry Equipment Manufacturers Association: Greenbrier Hotel, White Sulphur Springs, W. Va. Association's address: 1 Thomas Circle, Washington 5, D. C. Secretary: C. R. Heller.

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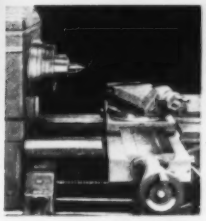

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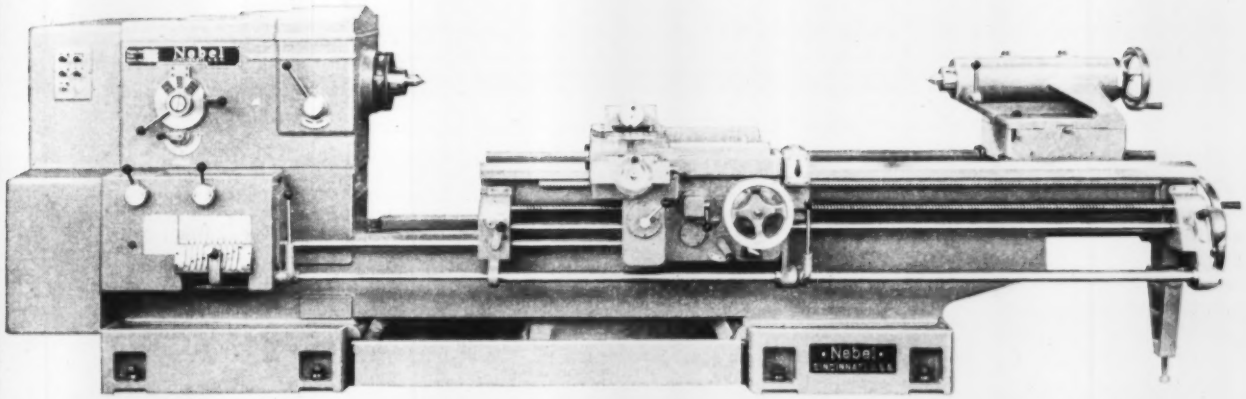

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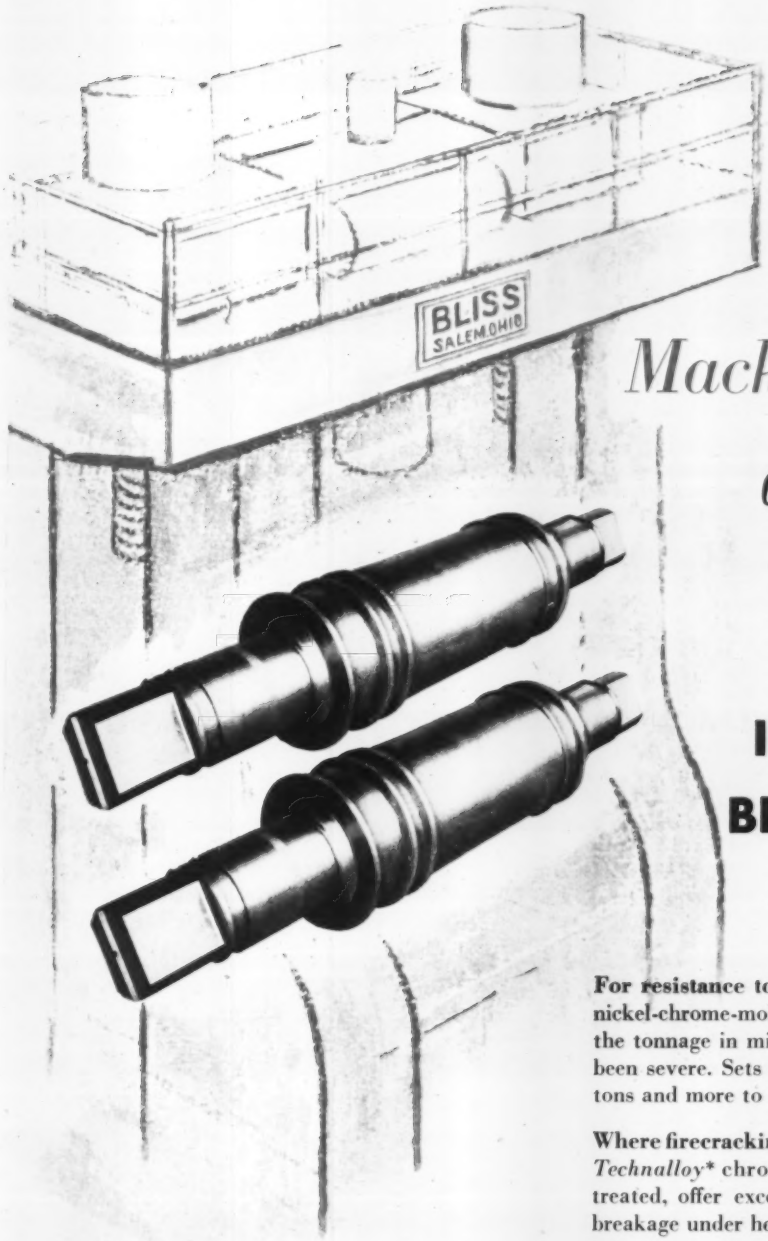

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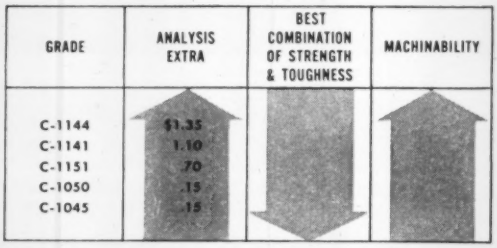

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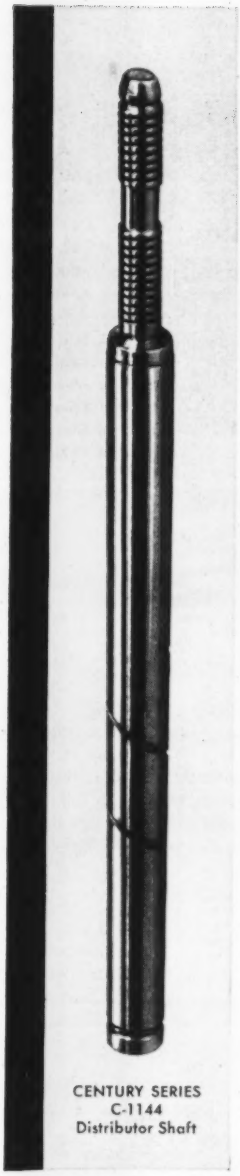

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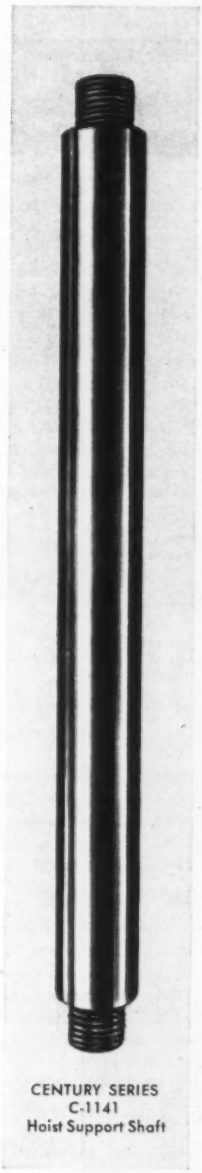

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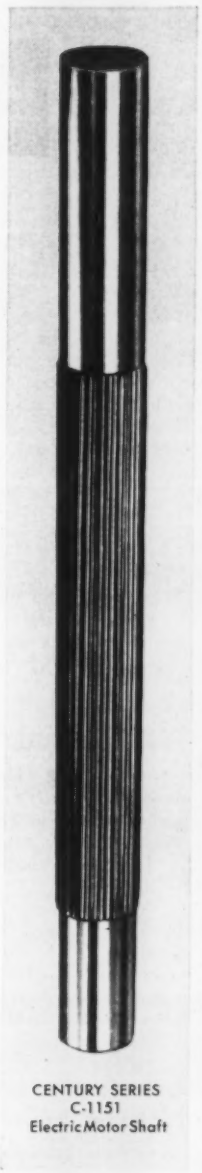

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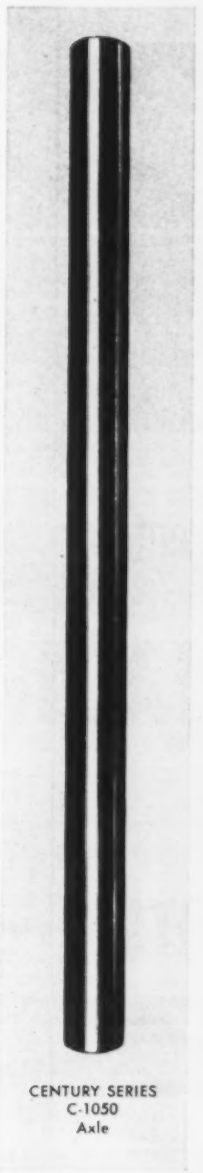

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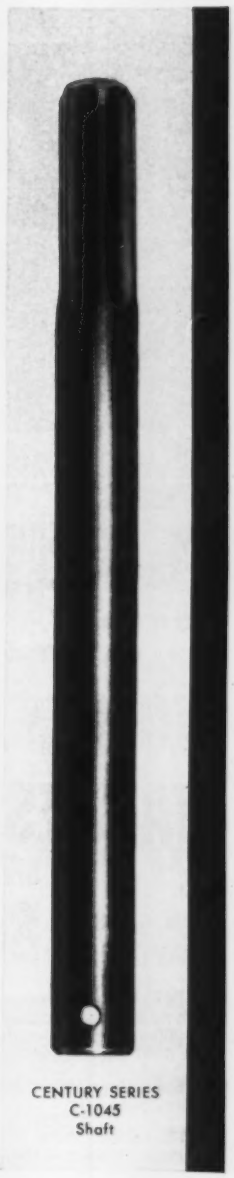

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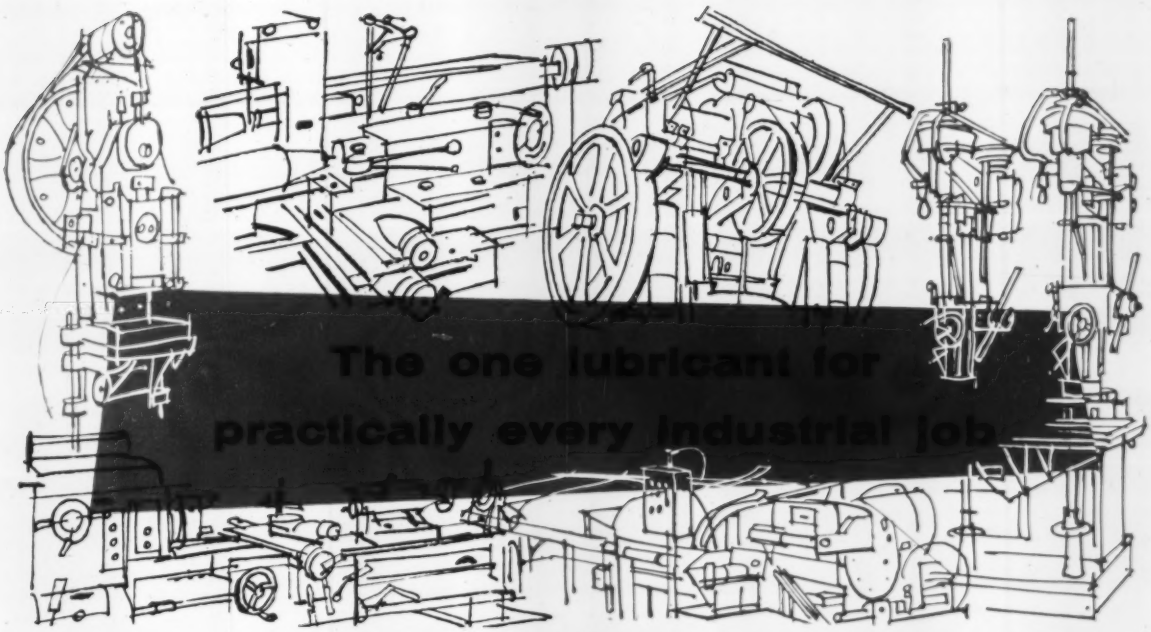

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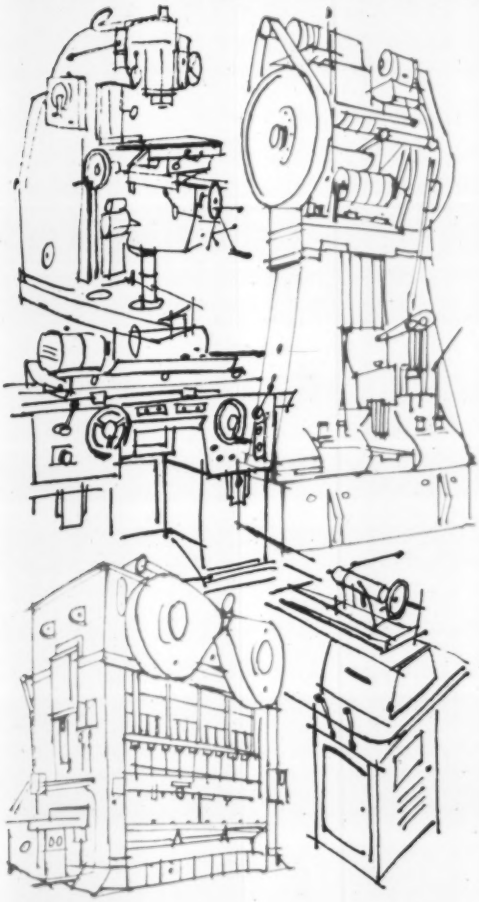

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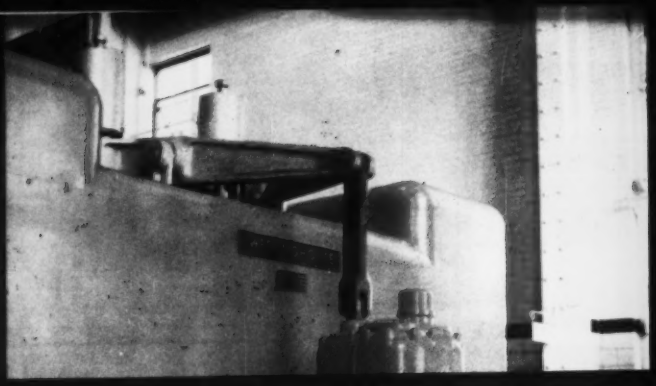

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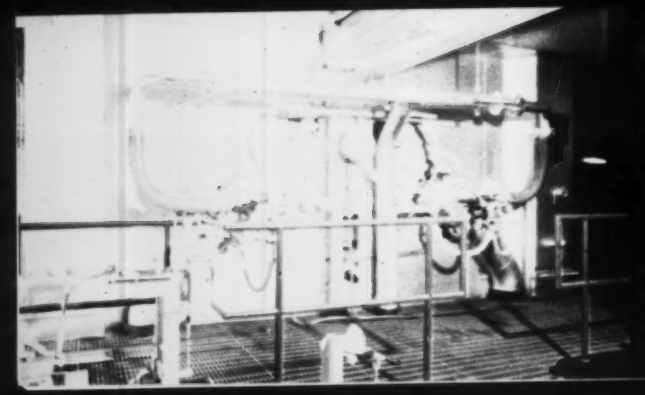

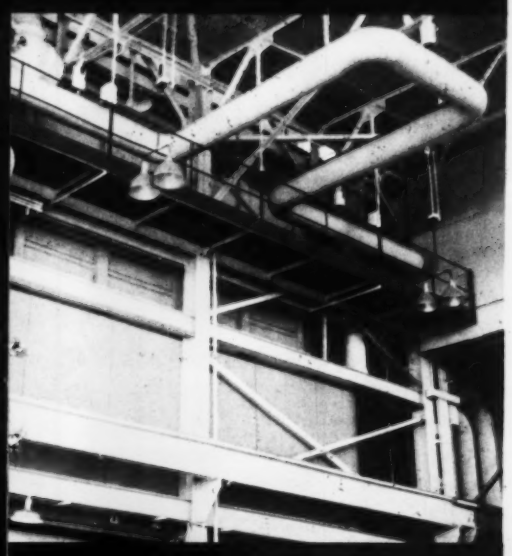

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- ☐ Information on matching special colors.
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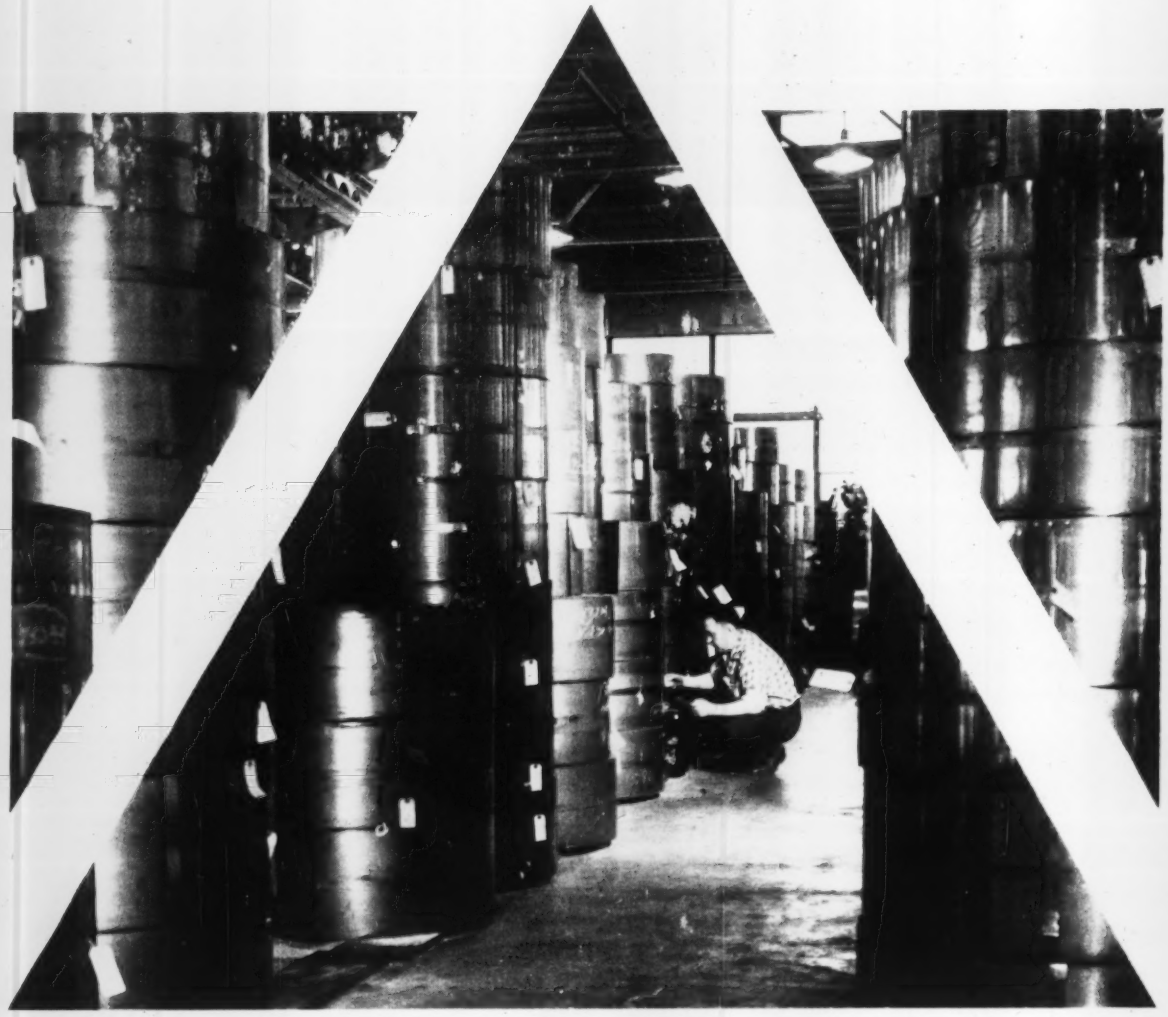

Right Down Your Spring-Steel Alley

The spring steel you need may be sitting in our mill—ready to ship from stock or to roll, slit, heat-treat and finish to your specifications—but fast. Strip steels in widths up to 6½" tempered and 13" annealed or hard-rolled. You specify temper, finish, color, edge, forming properties, tolerance, etc. Find out about these "steels of a lifetime." Write for our 4-page folder highlighting products made from Wallace Barnes Spring Steel. Try us on your next requirement.

Wallace Barnes Steel Division

Bristol, Connecticut

Associated Spring Corporation

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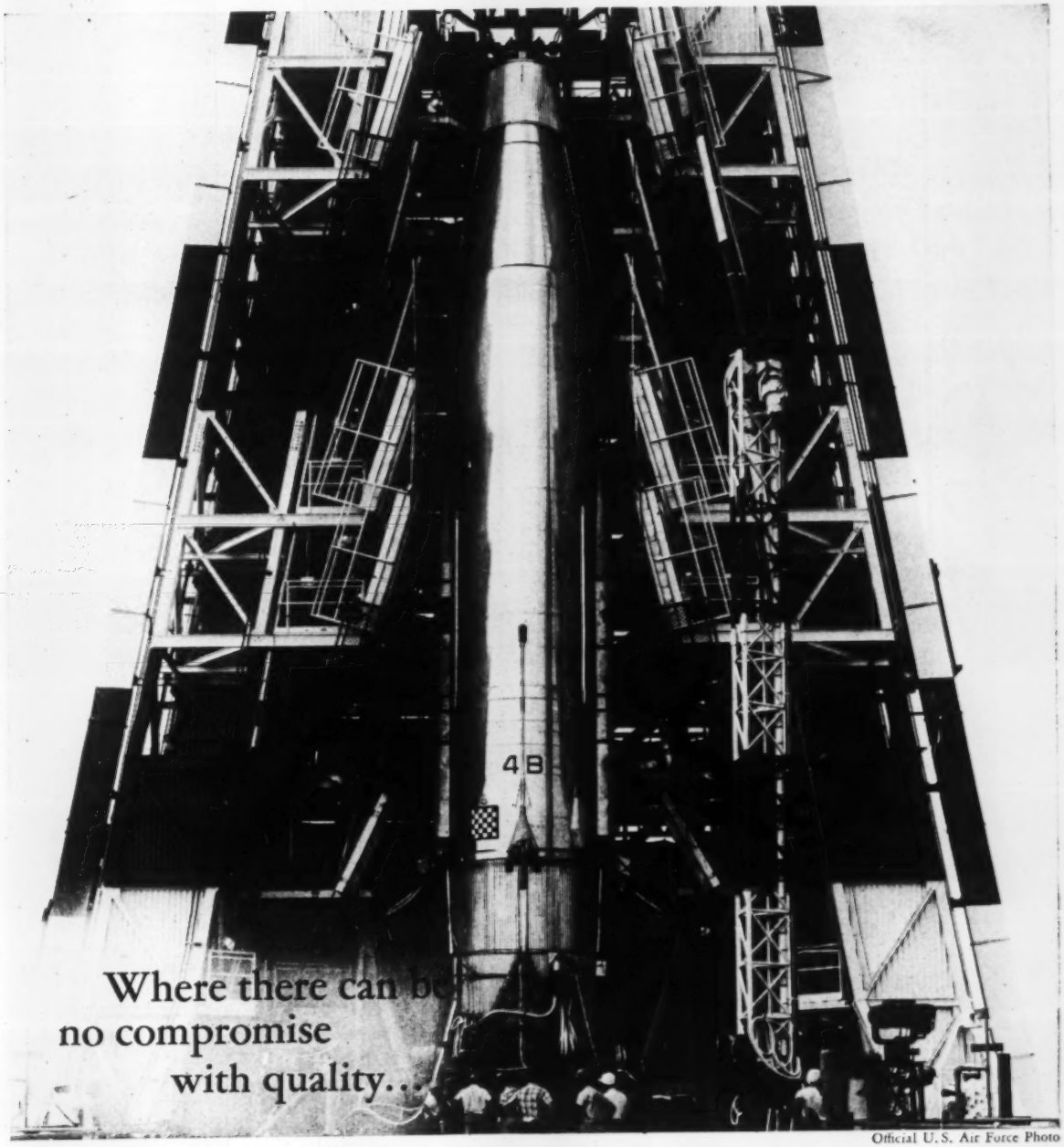

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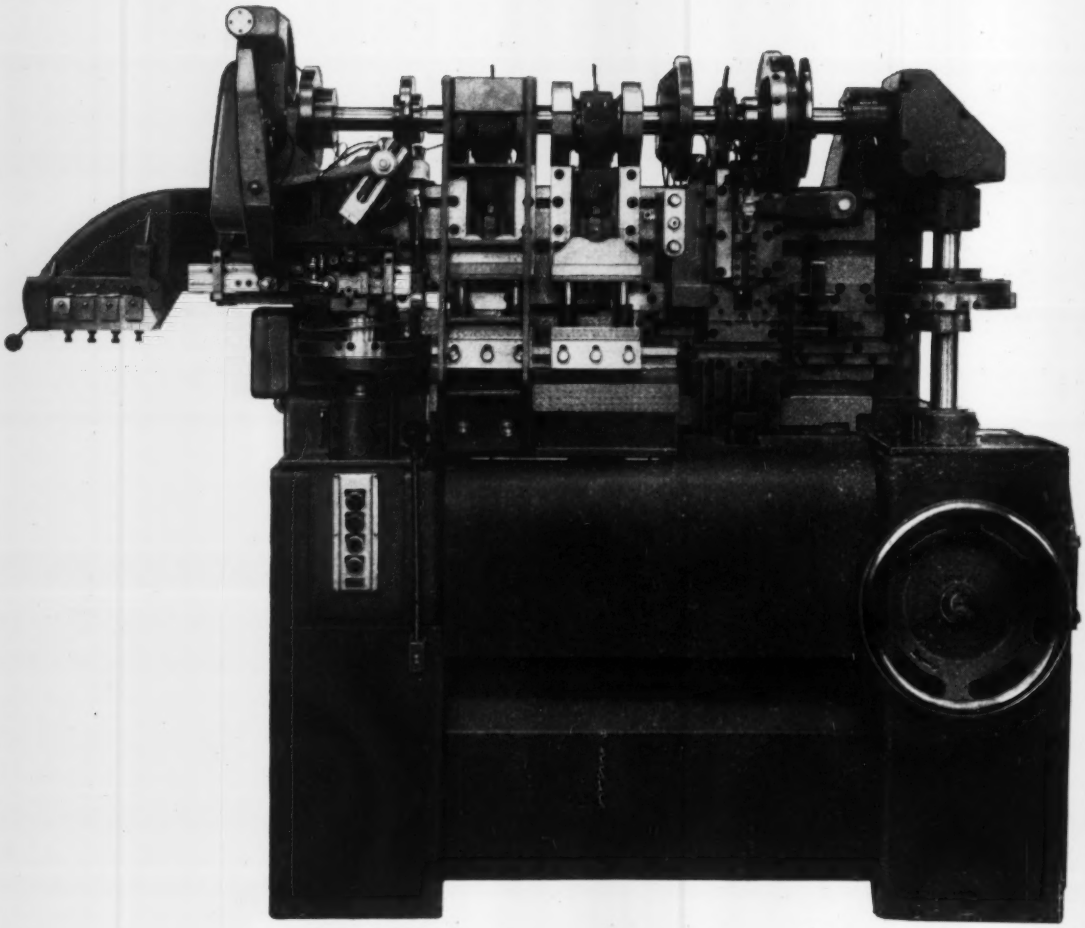

It's the sensational Torrington **Verti-Slide,** a most important **new** production tool. This amazing new vertical four-slide machine promises a genuine revolution in the **high-speed, high-precision, low-cost production** of just about everything in strip or wire that is now being produced on progressively tooled forming presses or conventional four-slide machines. Write or call today for complete technical data—or a Torrington sales engineer.

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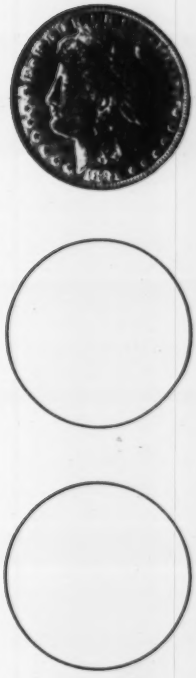

ONE important feature of automatic production is **the storage of shape in dies.** This is also the basis of closed die forging—"drop forging". **Chambersburg,** pioneer builder of equipment for making drop forgings, today builds tools that will shape forgeable materials to close tolerances by a combination of carefully designed die configurations, with precisely controlled forging blows and a fixed pattern of mechanized stock manipulation. When used with complementary shearing, heating, and trimming equipment, **fully automatic or semi-automatic production lines** are created which are capable of **increased output at lower costs.**

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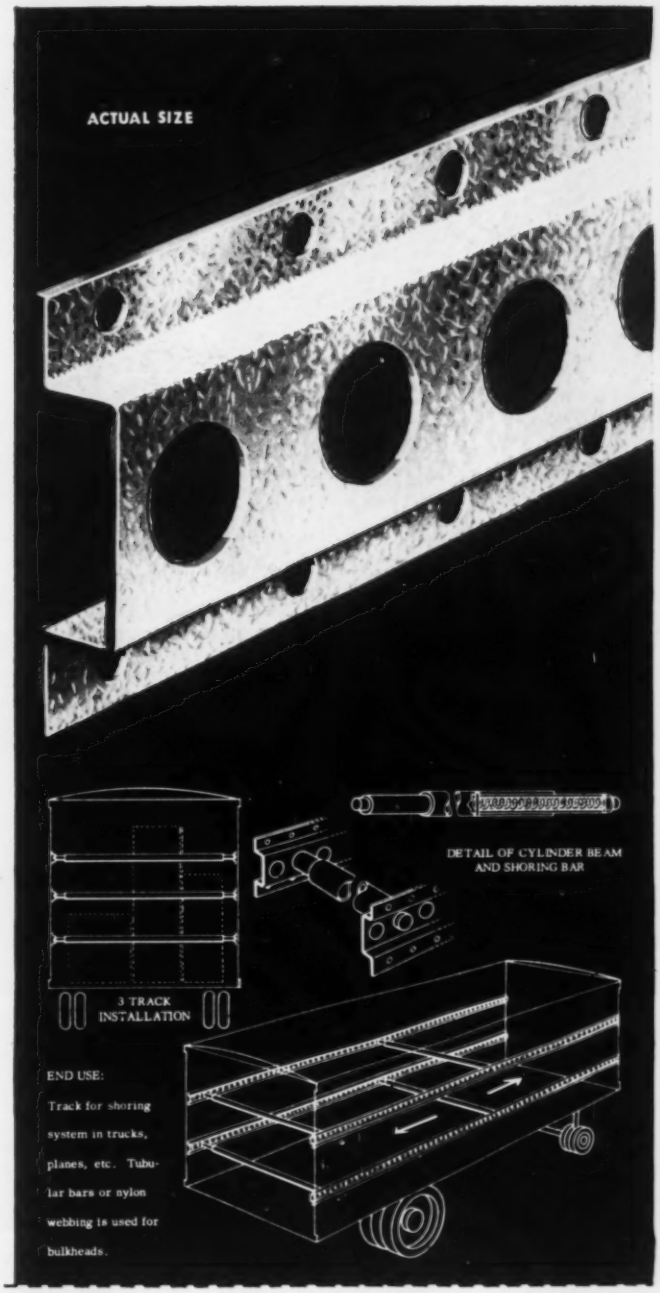
Aeroquip

CARGO CONTROL SYSTEM TRACK
BY

VAN HUFFEL

Where ideas (VH) *take shape*


ACTUAL SIZE
DETAIL OF CYLINDER BEAM AND SHORING BAR
3 TRACK INSTALLATION
END USE:
Track for shoring system in trucks, planes, etc. Tubular bars or nylon webbing is used for bulkheads.

This track for shoring system in trucks, planes, etc. was produced for Aeroquip Corporation and is just one of many ideas Van Huffel roller die, cold forms in metal for a wide variety of industries. Your requirements may call for a more complicated shape. If so, you will be interested in these advantages of Van Huffel cold formed metal shapes: (1) Any of the common metals—hot or cold rolled steel, stainless steel, high strength steels, coated steels, aluminum, copper, brass—as well as painted or plated metals or bimetal sections can be formed in any lengths. (2) Structural sections have a high strength-to-weight ratio. (3) Parts can be fluted, seamed, notched, beveled, welded, punched, coiled, curved and embossed. (4) The finish of the stock is not marred. (5) Sections can be formed from metal strip 33" wide of uniform thickness up to a maximum of .312 gauge and a minimum of .003 gauge.

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METAL SHAPES HANDBOOK

48 pages of information on material selection, fabrication methods, tolerances for roll forming and dozens of illustrated ideas that have taken shape in metal.

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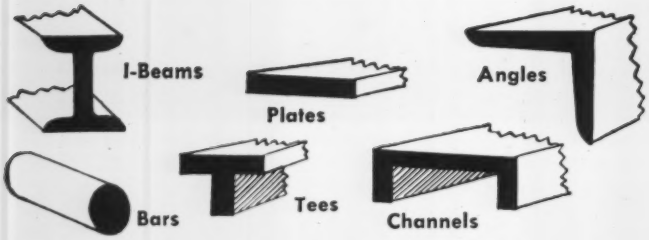
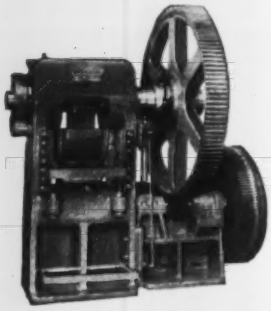
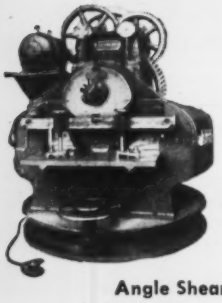


If you bend, roll, shear, punch, plane or straighten any of these shapes of metal— save time and money with

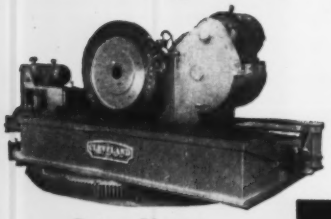
CLEVELAND
FABRICATING TOOLS



Bar Shears

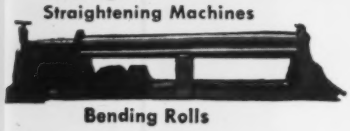


Angle Shears



Rotary Planers

Bending and Straightening Machines



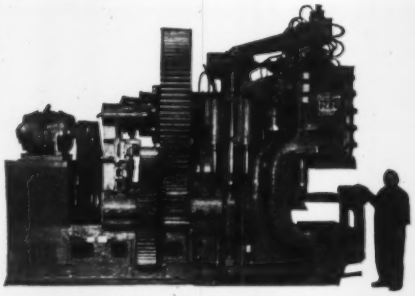
Bending Rolls

Simple to operate, ruggedly built, Cleveland Fabricating Tools are designed for efficient, trouble-free operation and years of service.

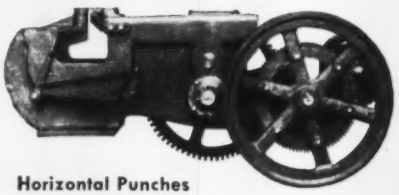
Leading shipyards, railroads, bridge builders, boiler makers, and other structural steel and heavy plate fabricators have proven the dependable, economical performance of Cleveland Fabricating Tools.

Since 1880, Cleveland has engineered its complete line of fabricating tools to be the finest, most efficient for punching, shearing, bending, rolling, straightening, planing, coping and notching I-beams, tees, zees, channels, bars, rods and other structural shapes.

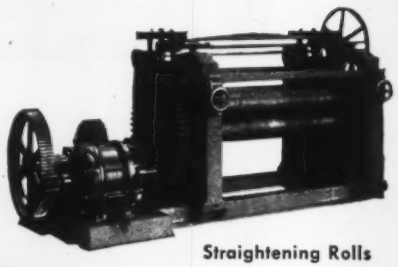
Write for Folder FT48 to help you determine the correct fabricating tool for your needs. AA-7494



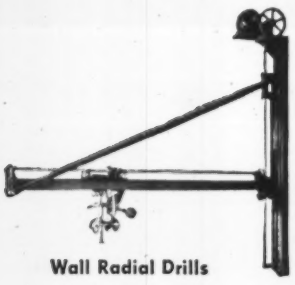
Vertical Open Gap Punching Machines



Horizontal Punches



Straightening Rolls



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remove up to 25% more metal every stroke with the "Magicut" All-Purpose file

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By changing to this file, you can cut metal filing costs as much as 25% compared to the next most efficient file for the same metal. The extra efficiency comes from the unique tooth pattern. The "Magicut's" teeth are on an extreme angle. They're termed "penetrating-planer" type teeth. As the name suggests, each stroke takes a deep bite and leaves a smooth surface.

To get faster results at lower costs, change from conventional machinists' files to the "Magicut." Use it on magnesium, copper, carbon steel and most other industrial metals. We believe you will see dramatic results. Ask your Nicholson or Black Diamond file distributor for a demonstration and try it yourself.

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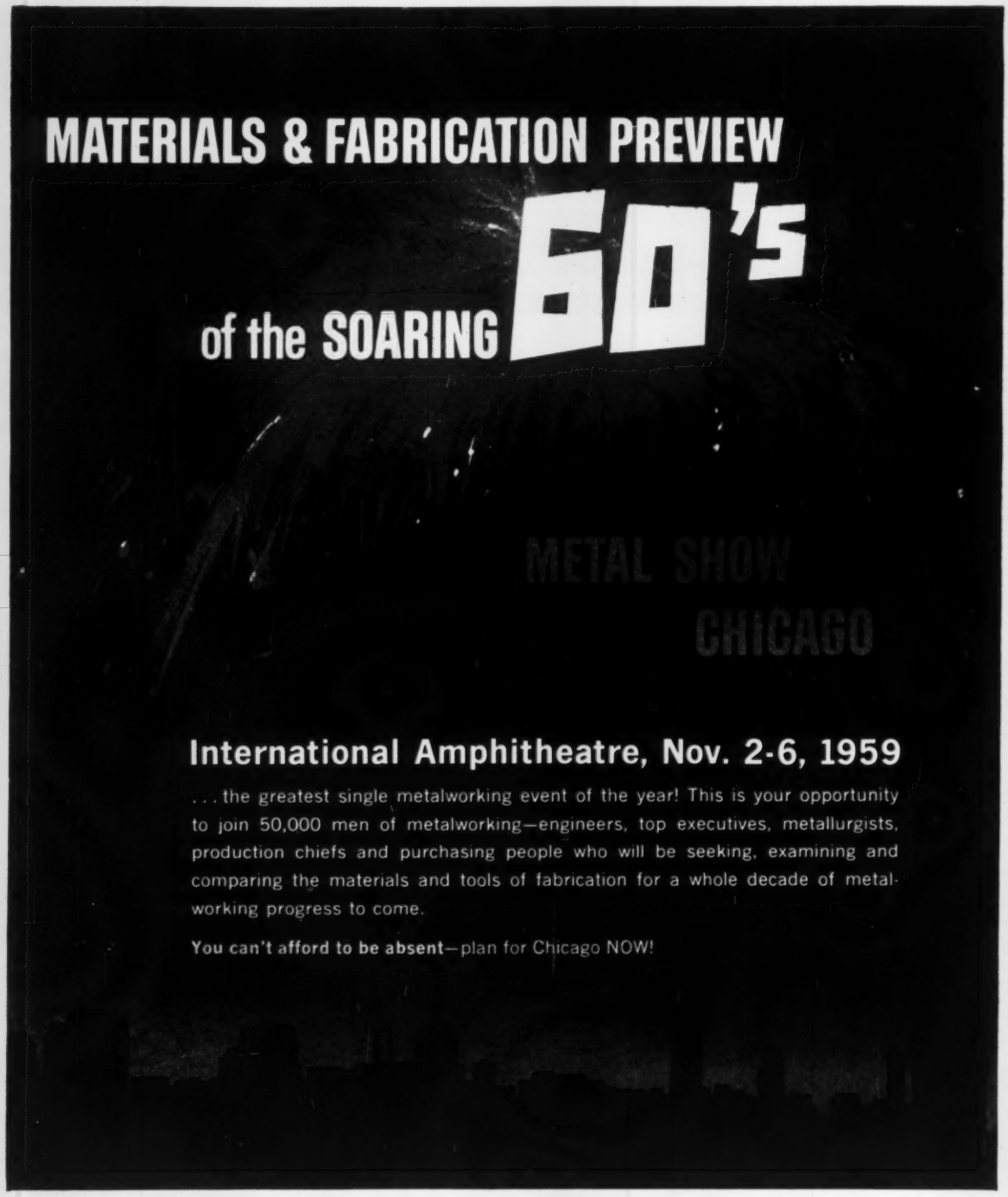
MATERIALS & FABRICATION PREVIEW of the SOARING 60's



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. . . the greatest single metalworking event of the year! This is your opportunity to join 50,000 men of metalworking—engineers, top executives, metallurgists, production chiefs and purchasing people who will be seeking, examining and comparing the materials and tools of fabrication for a whole decade of metalworking progress to come.

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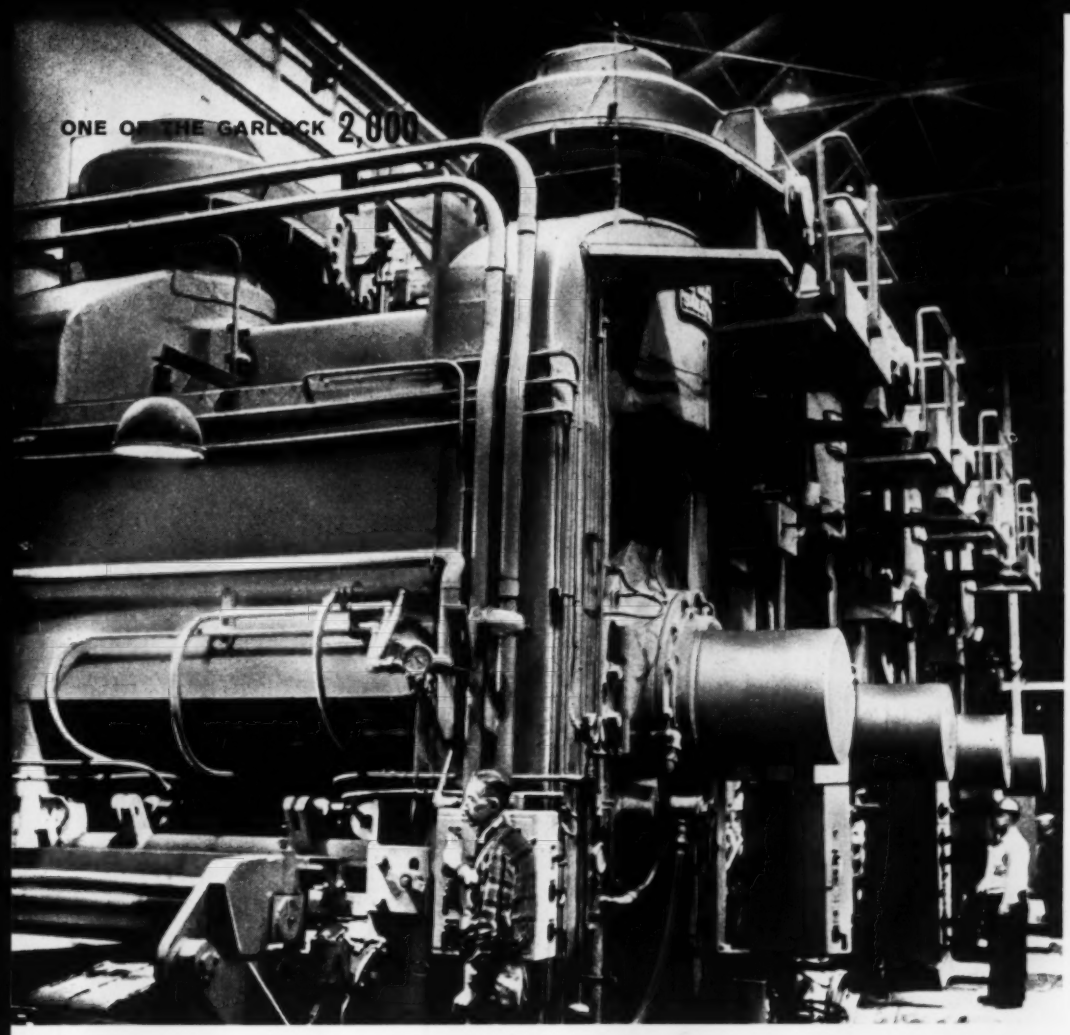

Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 bonded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split-KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular to shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.

On all mills—Bearings are fully protected by Garlock KLOZURE* Oil Seals

Everywhere in steel—on hot and cold strip mills, blooming and structural mills, rolling mills—Garlock KLOZURE Oil Seals prevent leakage of vital bearing lubrication. And, they further prevent damage to the bearings by sealing out dirt, spray, and other foreign matter.

Model 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Models 64 and 82 are ideal for protecting bearings on back-up and work rolls; Model 53 is recommended for table rolls; and, where equipment can't be dismantled easily, Model 21 or 23 split-KLOZURES are the choice.

All KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40° F. to +250° F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500° F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 20.

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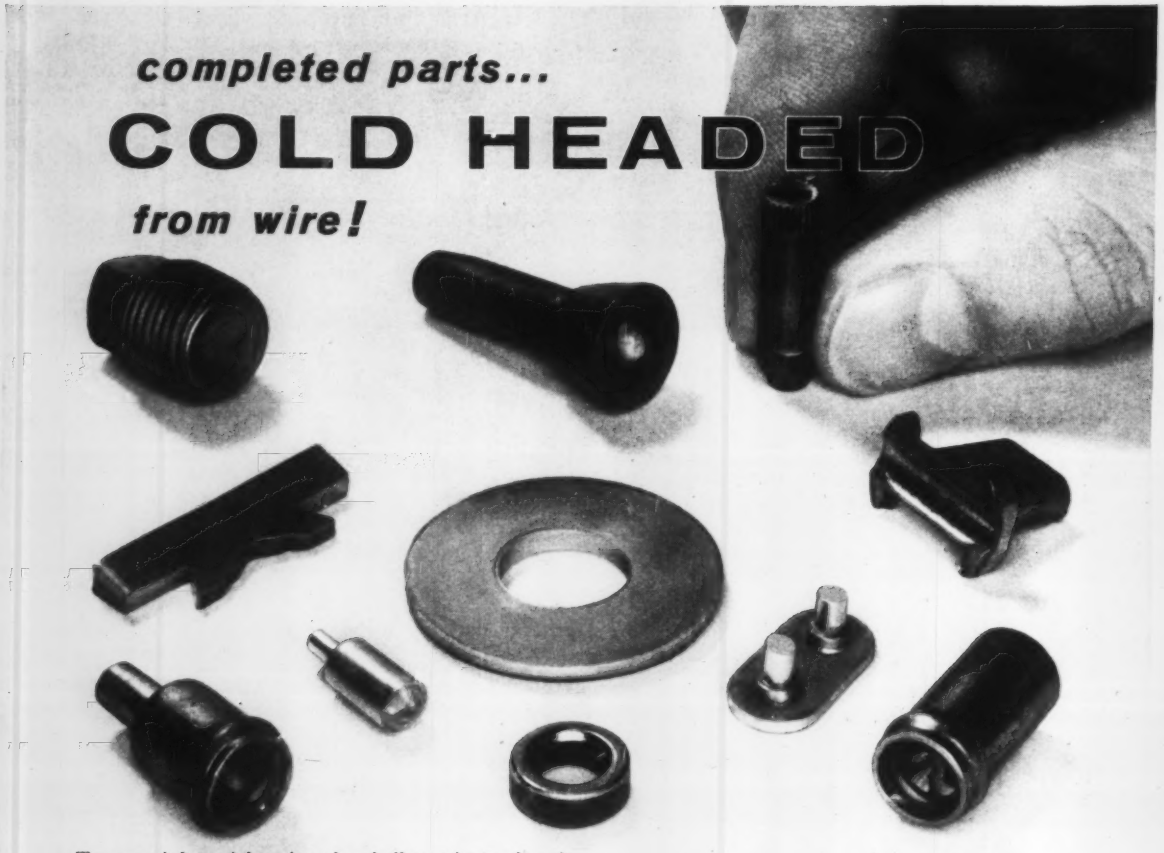
completed parts...

COLD HEADED

from wire!



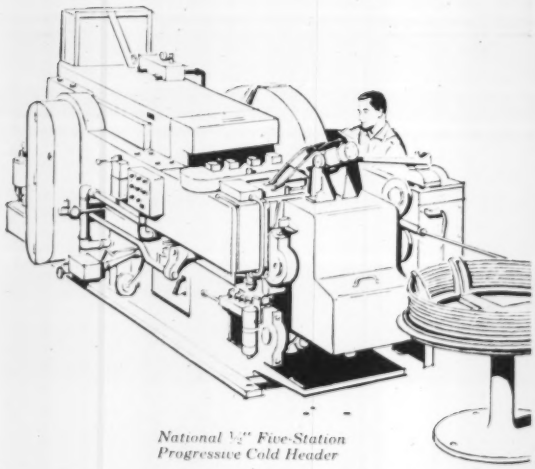
Top row, left to right: pipe plug, ball seat for push-rod end, splined square-head shaft. Middle row: commutator bar, solenoid contact, wire clamp. Bottom row: distributor cap insert, transistor case, spacer, link, distributor cap center wire insert.

All of the odd-shaped metal parts above were developed for fast, accurate production on National Cold Headers.

Complete and ready to use, these parts are made from wire, start-to-finish in one compact machine, at unbelievably high speeds with excellent die life, in most cases with no loss of material!

Production ranges from 40 parts per minute with stock of 1½" diameter up to 450 per minute in the ⅛" size. The jobs illustrated average 161 per minute.

Have you investigated Cold Heading? If you now have headers, have you considered widening your range and type of work to meet the growing requirements of metalworking?



National ½" Five-Station Progressive Cold Header

Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

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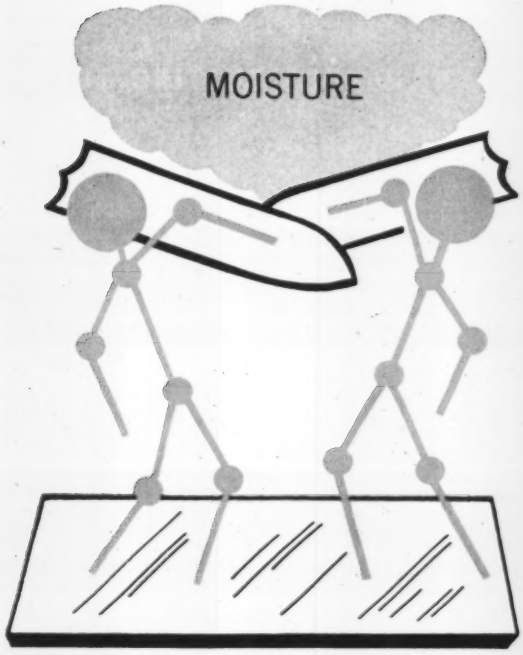
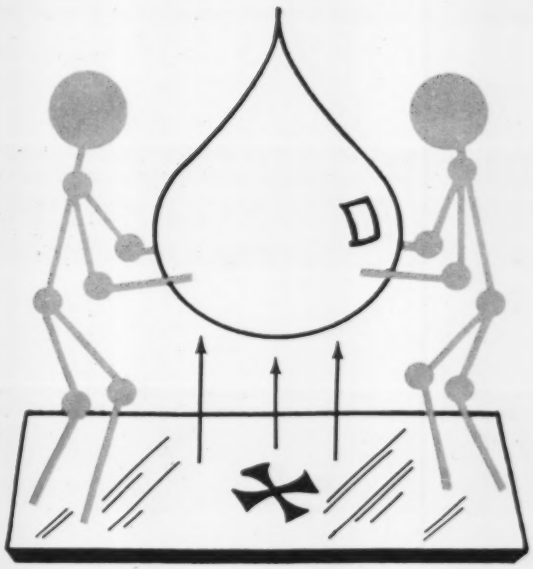


protects dry metal...



even raises water off wet metal

POLARIZED RUST VETO 377

Whether they are dry or dripping wet, precision finished metal parts can now be protected against rust with a thin, tough, almost invisible .0003" film of long-lasting, multi-purpose Rust Veto 377.

Rust Veto 377 literally displaces moisture and clings to the metal for complete protection, even in damp, humid indoor conditions. It resists oxidation for as long as a year without deterioration of the protective film and can be used effectively without staining, on all types of metal parts either in process or packaged for sale.

For full details about Rust Veto 377 send for NEW ILLUSTRATED BULLETIN; for help on any industrial rust prevention problem, call or write: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

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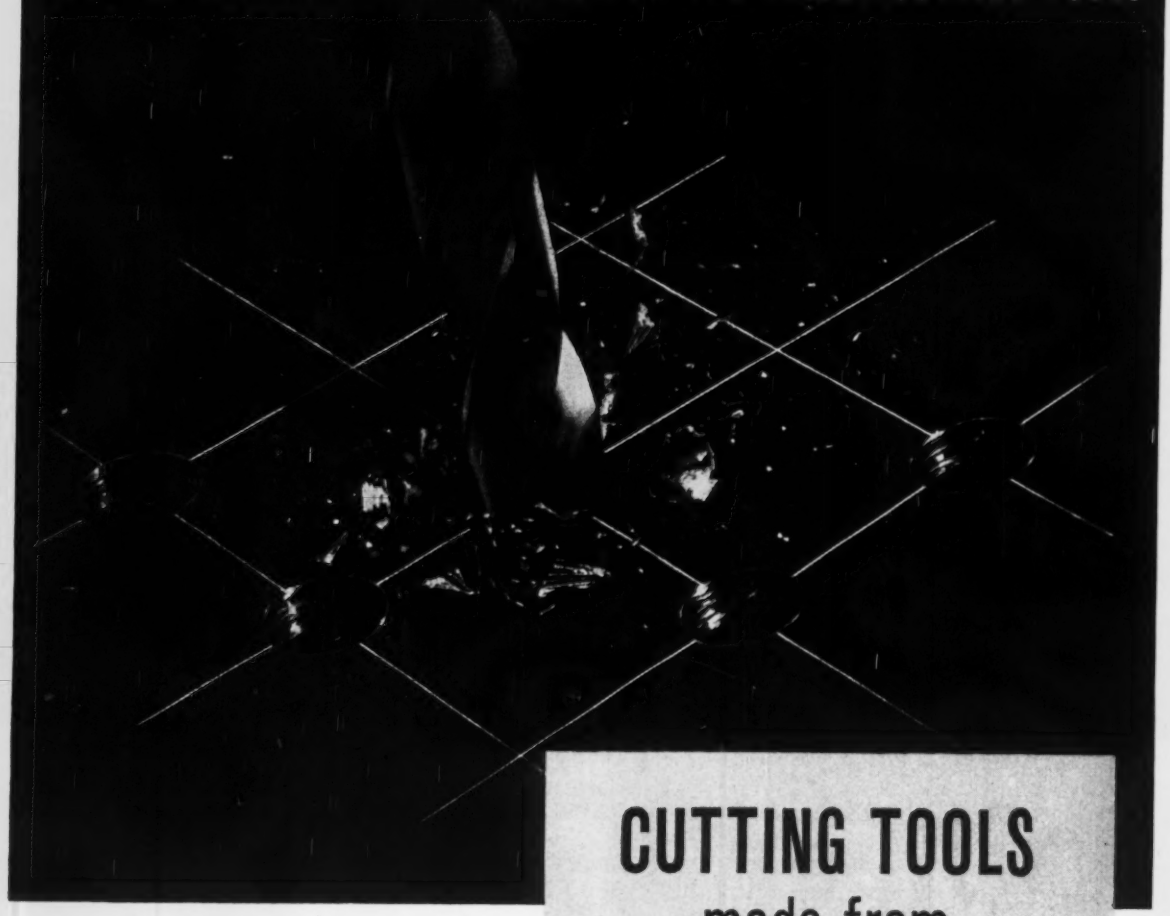
LOOK TO AMERICAN TOOLMAKERS FOR THE FINEST CUTTING TOOLS



CUTTING TOOLS made from HIGH SPEED STEELS *are Better Than Ever*

Today's high speed tools for drilling, tapping, milling, sawing and other metal cutting operations are better than ever. Through research and development, and new and better production methods, American toolmakers are constantly improving high speed steel tools to help you make better products . . . at less cost.

As a leading producer of high speed and other specialty steels, Universal-Cyclops continues to aid your toolmaker's efforts with its own aggressive research and development program.

Look to your American toolmaker for the finest in high speed steel cutting tools!

UNIVERSAL CYCLOPS
STEEL CORPORATION
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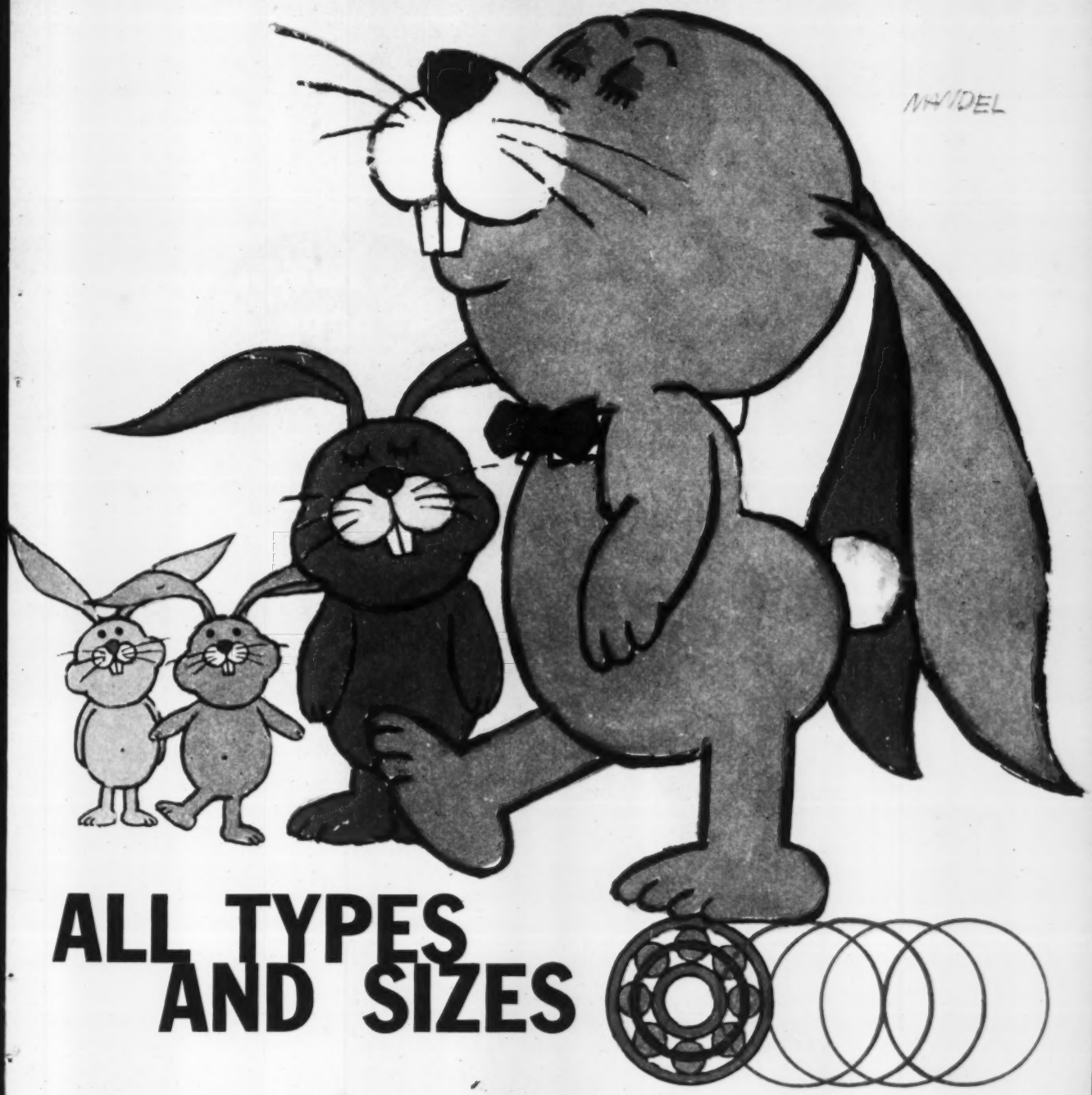
TOOL STEELS • STAINLESS STEELS • HIGH TEMPERATURE METALS



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Here at Federal, we're proud fathers to over 12,000 different sizes of ball bearings and hundreds of types. A fine family and still growing, (not that we want to boast.) 12,000 strong, they stand ready to satisfy almost any application need that American industry can think of (and believe you us, American industry can think of some lulus). Would you like to meet the Federal family? We just happen to have their pictures – and names and numbers – in the form of a handy catalog which we'll ship you at the drop of a letterhead. Best looking, hardest working bunch of ball bearings you've ever seen. Write for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

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BALL BEARINGS

One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

You can't

bargain with safety!

Use a safe wire rope...use

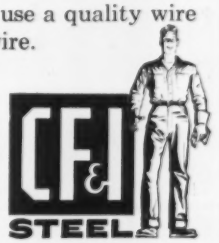
CF&I-WICKWIRE

This giant steelman is the Image of CF&I—and of the many steel products produced by CF&I for every type of industrial use. He represents the quality controls that CF&I exercises during every step of manufacture—from ore to finished product.

Nowhere is this exacting attention to quality more rigorously followed than in the production of Wickwire Rope. That's because a quality rope is a safe rope. It helps the user eliminate losses due to injuries or wrecked equipment that can result when a "bargain" rope fails.

Wickwire Ropes are available in a complete range of sizes, constructions and grades—including Wickwire Double Gray *extra*-improved plow steel rope for your extra high strength rope requirements.

For safety's sake, use a quality wire rope . . . buy Wickwire.



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THE COLORADO FUEL AND IRON CORPORATION

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6631

What's the lowest cost way to produce steel parts like these?

You may be paying considerably more than you need to for parts like these if you aren't taking advantage of Ryerson flame-cutting service.

Size makes no difference—nor intricacy of shape. You can order one part or one thousand and get quick delivery of steel cut to close tolerance—with almost die-cut accuracy from piece to piece. And here's where the saving comes in:

1. **No dies or molds** are needed so you save this cost when you switch from cast or forged parts to flame-cut parts.
2. **Less machining** is usually required to finish a flame-cut part. Sometimes machining is eliminated altogether.
3. **Freight costs lower**—If you're now paying freight on steel you later scrap you may well be able to pay for flame cutting with the money you save by shipping lighter flame-cut parts. The blank for a 6" disc is 49% heavier than the disc itself. Storage and handling expenses are reduced, too.
4. **Less time in process**—You can often convert finished products into cash more quickly because parts can be produced faster by flame cutting.
5. **No loss on spoilage or rejects**—They're our problem—not yours.
6. **Design changes are simpler** and can be made more frequently without sacrificing manufacturing economy.

You draw on the nation's largest steel stocks at Ryerson—and unequalled flame-cutting facilities are ready to work for you. A blue print or sketch with clearly marked dimensions is all we need for prompt handling of your requirements. Call your nearby Ryerson plant for cost-cutting flame-cut steel today.

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NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

Metalworking Outlook

October 5, 1959

Rough Poststrike Convalescence Ahead

Convalescence after the steel strike may hit fabricators harder than the walkout itself (Page 45). The overwhelming majority of metalworking's 70,000 plants haven't had to curtail operations up to now. But many of them are on the verge of doing so. Steel mills, on the average, will need six weeks from the time of settlement to hit 90 per cent or better of their shipping capacity. That's the six weeks of convalescence when many a metalworker will be hard pressed to keep healthy steel stocks.

Who'll Be Next Chief of Big Steel?

Veteran steel industry observers expect Stephen M. Jenks, 58, to succeed the late Walter F. Munford (See Page 74) as president and chief administrative officer of U. S. Steel Corp. Mr. Jenks, who is executive vice president-engineering and research, has a broad background in operations. His career parallels that of Mr. Munford. Another prominent possibility is Harvey B. Jordan, executive vice president-production. But Mr. Jordan's age, 64, seems to rule him out, except for an interim appointment. Other possibilities: Van H. Leichliter, president, American Steel & Wire Div.; Leslie B. Worthington, president, Columbia-Geneva Steel Div.; Richard F. Sentner, executive vice president-commercial; R. Conrad Cooper, executive vice president-personnel services; Arthur V. Wiebel, president, Tennessee Coal & Iron Div.

To Boost Productivity, Watch the 'Other 40 Per Cent'

In your search for ways to boost productivity, don't overlook the mountains of paper moved, sorted, shuffled, and reviewed in your offices. Well devised systems and procedures can cut personnel costs as much as 30 per cent. And that's a whopping addition to profits when you consider that 40 per cent of your sales dollar is expended on organization and policy matters. You can measure the production of whitecollar workers. And you can determine their attitudes toward their jobs. Corrective measures will keep your office people from being bored and inefficient like the fellow in the picture (Page 50).

Will Justice Seek Split-up of GM, U.S. Steel?

Washington is hearing some strong hints that the Justice Department may seek to vivisect two industrial giants—General Motors Corp. and U. S. Steel

Technical Outlook—Page 91

Market Outlook—Page 129

Corp. One indication came as Sen. Paul Douglas' Joint Economic Committee resumed its hearings. Antitruster Robert A. Bicks informed Senator Douglas that about 20 per cent of the Antitrust Division's resources are being devoted to a study of whether it would be in the public interest to split GM into several companies. Asked if Justice was doing anything on U. S. Steel, Mr. Bicks said that two of his top men are "beyond the preliminary stages" in a study of steel industry price policies.

Why Should You Aid Education?

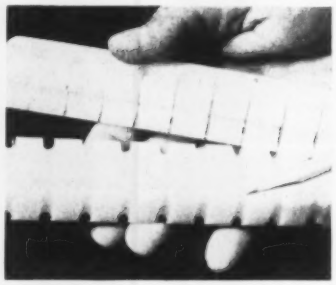
A good answer to that question comes from W. S. Markham Jr., executive secretary, Burlington Industries Foundation. He says: "Expenditures for education yield a high return for business. A well educated person consumes more and produces more. He makes wiser decisions on the job, in the home, at the voting booth, in the market place . . ." Such thinking on the part of corporate executives is resulting in record gifts by business to our educational institutions. Perhaps you're considering joining in the effort. For tips on figuring gifts, see Page 60.

No Slowup in Defensework, Says Cresap

"Crash programs are always costly. They're always inefficient. But today . . . they can be fatal. A long range, stable, continuing, defense program is preparation for peace and is essential to our survival. What we do today will irrevocably determine our defense posture five, ten, or more years from now." Those words from Mark W. Cresap Jr., president, Westinghouse Electric Corp., point up the need for continuing large defense programs. Since the key problem today is not how to get more weapons, but how to get better ones, a temporary easing of tensions should not result in a cutback in R&D programs.

Nylon Solves Fabrication Problems

Users of prefinished aluminum extrusions and welded tubing are solving many of their fabrication problems with nylon tools made in stock shapes. The nylon mandrels in the picture are an example. The tools don't pick up aluminum from the tubing. And they don't cause galling. Use of stock shapes trims material costs and holds machining to a minimum (Page 111)

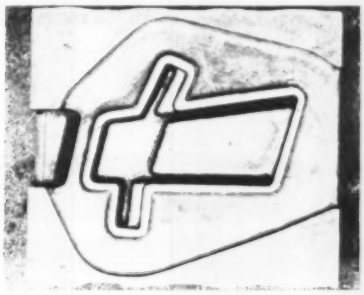


British Import Boom: Good or Bad Omen?

For the first time since 1865, the U. S. is buying more goods from Britain than we're selling to her. Our buying this year (items include machine tools, autos, safety pins, jet engines) is running above $900 million (up

nearly 40 per cent from 1958). Our sales come to about $800 million (down about 1 per cent). Against that background, Britain is planning the biggest exhibit of her goods ever seen in the U. S.—from June 10 to 26 next year in the New York Coliseum. It'll cost an estimated $9 million. Twice the size of the Soviet exhibition, it'll be aimed at selling the U. S. more than $1 billion worth of goods in '60. Armed with more dollars, Britain might relax her trade barriers, and U. S. sales to her could shoot up again.

Hot Dies Aid Forging



In the picture: Not an ancient religious art piece nor a fossil, but a hot die that promises bread-and-butter benefits to forgers, plus better and cheaper parts for users. It's used in a new process developed by Armour Research Foundation, Chicago. The technique permits you to approach finished part dimensions in a rough forging (Page 92).

Detroit Aims at Solving Dock Problems

Private capital is helping Detroit solve its shortage of dock facilities. Three firms are spending $8 million to boost dock space from 1900 to 7000 ft. Detroit Harbor Terminals Inc. will spend $4 million so it can handle up to 1 million tons of cargo annually; Detroit Marine Terminals Inc. will spend $1.5 million to double its dock space; Todd Steel Corp. will spend $2.5 million on facilities to cover 3200 ft of Detroit River waterfront.

Leisure, Wild Sounds Mean Money for Metalmen

Stereo is turning up the volume of the already booming high fidelity industry. America's constantly increasing leisure time promises to give the hi-fi industry the same kind of phenomenal growth that is experienced by makers of boats, motors, swimming pools, and the like. Have you checked the possibility of cashing in on some phase of this healthy young leisure market? More vigorous growth is coming (Page 57).

Coming in February: The First Argonaut

"Not an auto, nor a motorcar, but a machine." That's how company officials describe the Argonaut. They say its much finer materials set it apart from other automobiles. The Argonaut "is not a transient possession," says one company official. That seems obvious from the specifications of the first model, a "Smoke," which will hit the road in February. Listing at $23,600, the two passenger, aerodynamic roadster is 236 in. long and has a 126.5 in. wheel base. The interior is leather, stainless steel, and aluminum. The

chassis is made of stainless and designed to accept a lightweight efficient body. "We think stainless would be the ideal body material, and we're trying to find a way to get its weight down. But until we do, we'll use aluminum for the bodies," says a company official. Stainless is used in gear shift and brake linkages, fuel tank, exhaust system, radiator brackets, and other components. Optional equipment will include air conditioning, vanity, telephone, desk, recording equipment, refrigerator, and a portable radio with transcontinental receiving range.

What Nicaro Buyer Will Get

Here's the government's multimillion dollar nickel producing and processing complex at Nicaro, Cuba, that's going on the auction block. It includes an extraction plant (annual capacity: 54 million lb), ore reserves estimated at 32 million to 35 million tons, tailings, mining and transportation facilities, labs, shops, warehouses, and a complete town (Page 53).

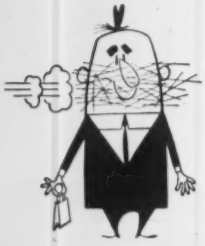
Eisenhower Predicts a Lengthy Boom

President Eisenhower told the annual meeting of the governors of the 68 nation World Bank and International Monetary Fund that the U. S. economy is well advanced into a new period of growth that should extend far into the future despite the steel strike. He added that consumer price stability and a balanced fiscal 1960 budget show that progress can be made in achieving inflation-free economic growth.

Construction Feels Sharp Impact of Strike

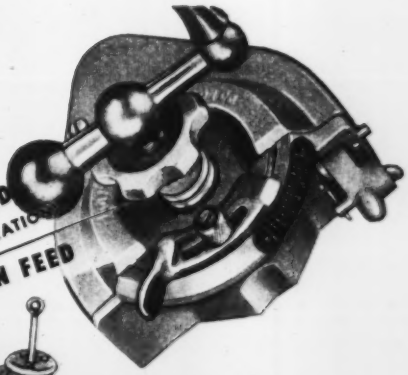
Uncertainty over steel deliveries and prices is causing extensive deferment of nonresidential and heavy construction projects, reports F. W. Dodge Corp. Work on jobs where contracts have been delayed will be held up for months after the walkout ends, asserts a Dodge official. Building awards in August declined to about $3 billion—off $600 million from July's and 11 per cent below the August, 1958, figure.

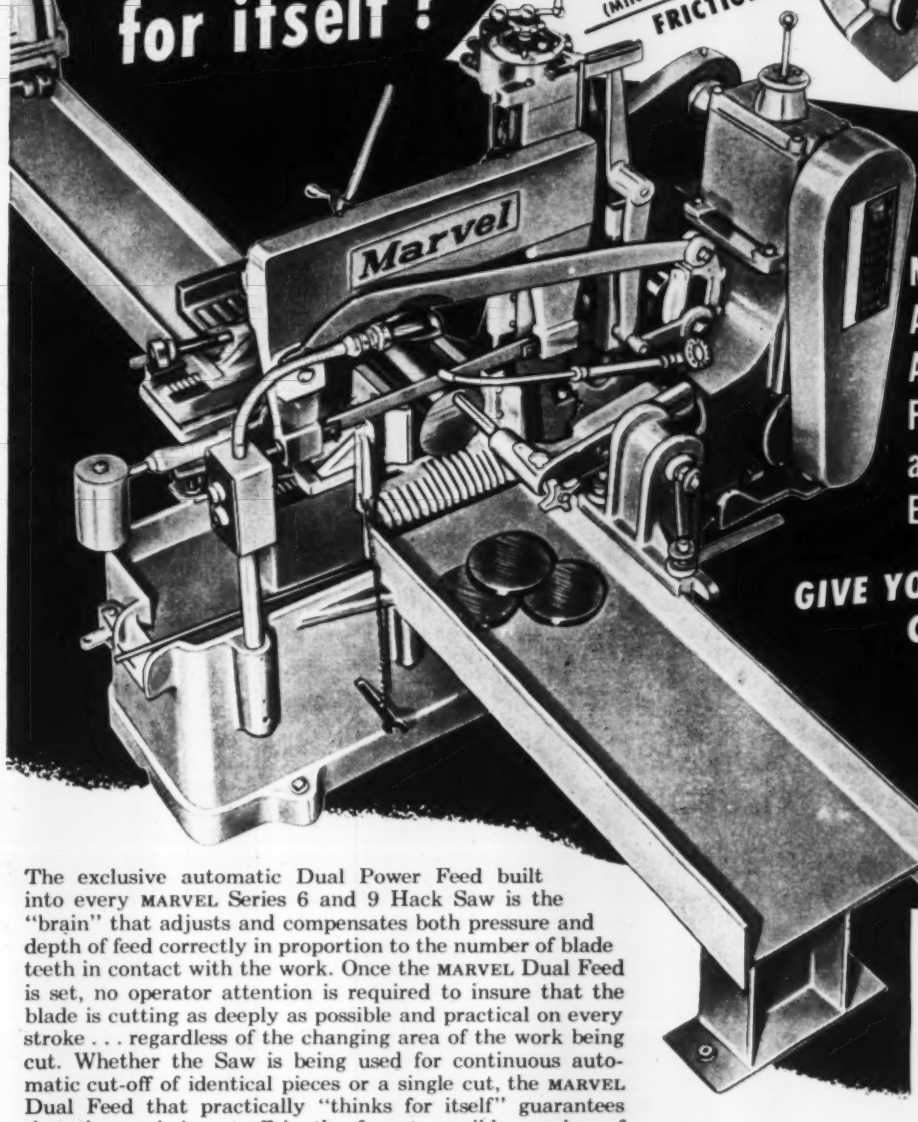
Straws in the Wind



American Can Co. and the United Steelworkers extended their contract to 30 days after basic steel companies sign or Jan. 1, whichever is sooner . . . General Electric Co. will build a $1.8 million electrical system for a new billet and merchant mill to be installed at the Wisconsin Steel Works of International Harvester Co., Chicago . . . General Electric Co. has cut prices an average of more than 5 per cent on large power transformers; Westinghouse says it will stay competitive . . . Inland Steel Co.'s president, Joseph L. Block, has asked striking employees to write their union representatives expressing their views on the industry's proposed contract changes.

ever see a METAL SAW that thinks for itself?





MARVEL SAWS' Automatic "Brain" Adjusts Blade Feed Pressure and Depth on Every Stroke to

GIVE YOU FASTER CUTTING-OFF

The exclusive automatic Dual Power Feed built into every MARVEL Series 6 and 9 Hack Saw is the "brain" that adjusts and compensates both pressure and depth of feed correctly in proportion to the number of blade teeth in contact with the work. Once the MARVEL Dual Feed is set, no operator attention is required to insure that the blade is cutting as deeply as possible and practical on every stroke . . . regardless of the changing area of the work being cut. Whether the Saw is being used for continuous automatic cut-off of identical pieces or a single cut, the MARVEL Dual Feed that practically "thinks for itself" guarantees that the work is cut-off in the fewest possible number of strokes.

Heavy duty MARVEL Series 6 and 9 Hack Saws embody every practical design and operating feature to give you speed, accuracy and operating economy you can find in no other metal cutting saws.

Catalog C 85 has complete details, facts and figures on both Marvel metal Cutting Hack Saws and Band Saws. Write for it today.

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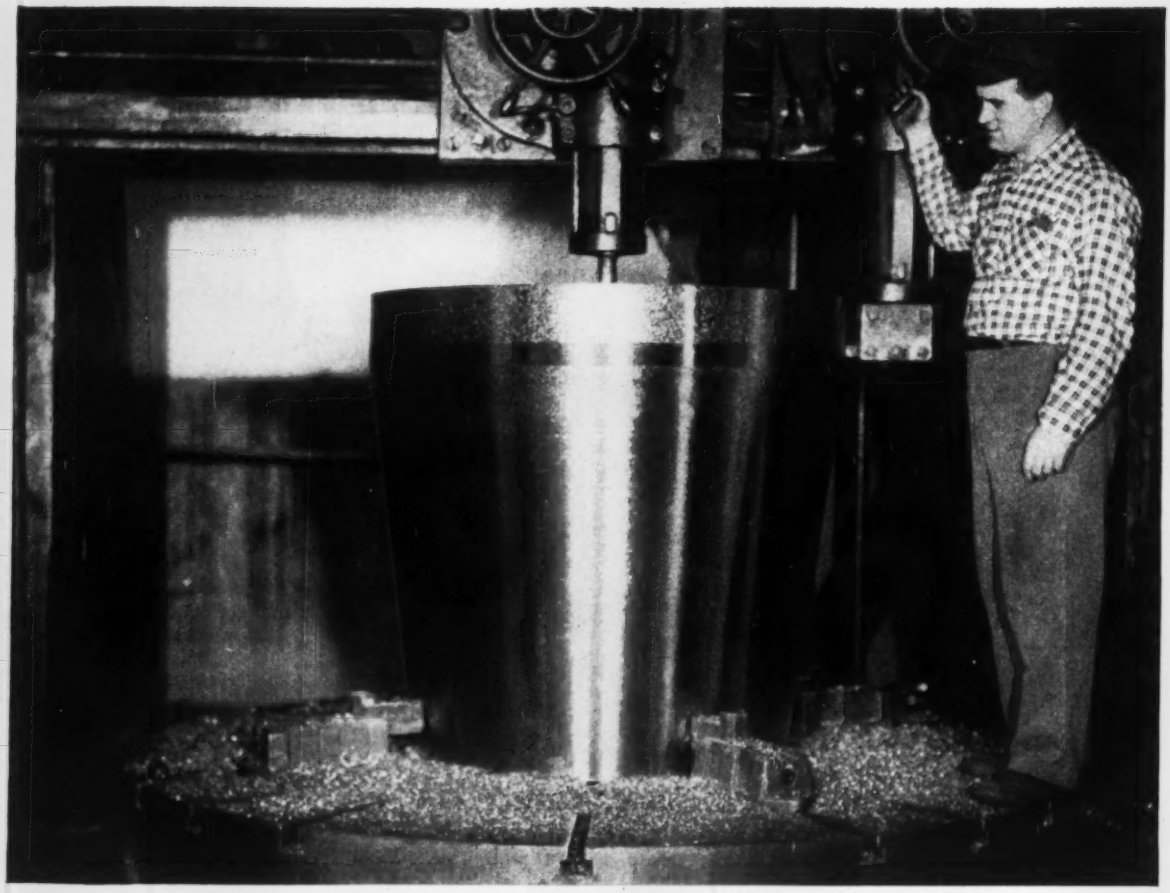


Five times longer service expected from Ni-Vee bronze filter cone. Cast by A. W. Cadman Mfg. Co., Pittsburgh, Pa. Finished and installed in 12" automatic self-cleaning strainer by S. P. Kinney Engineers, Carnegie, Pa.

Cone made of Ni-Vee* bronze to last 5 times longer in acid river water

The filter cone you see above is being readied for work in corrosive Monongahela River water.

That's why it's made of Ni-Vee bronze.

Expected life is at least five times longer than its predecessor, a grey iron cone now badly eaten away. Installed in a 12" automatic self-cleaning strainer, the Ni-Vee bronze cone will give long-lasting support to filter elements that remove solids from water used for blast furnace cooling.

Another important consideration in making this cone was machinability – all outer surfaces were drilled to receive filtering elements. Ni-Vee bronze easily met this need.

Versatile Ni-Vee bronze

Ni-Vee bronze does a multitude of industrial jobs. Five basic bronze compositions are available – Ni-Vee A, B, C, D, and E. They're modifiable to meet all industrial needs for brass and bronze constructional, pressure or bearing castings.

All the Ni-Vee bronzes deliver excellent "as cast" strength, improvable with heat treatment. (For example, Ni-Vee A bronze yield strength can be increased from 22,000 psi as cast, to 55,000 psi!) In addition, they supply easy castability, low shrinkage, pressure tightness, fine grain size and overall economy.

Each Ni-Vee bronze provides special properties. Type A gives extreme strength. Type D furnishes very high resistance to seizure and galling. All types show little dezincification or stress corrosion under corrosive attack.

Informative booklet on Ni-Vee bronzes

"Engineering Properties and Applications of Ni-Vee Bronzes" covers alloy compositions, strength properties, resistance to high temperatures, corrosion, wear, along with other helpful information. Write us for your copy. *Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N. Y.

NI-VEE BRONZES

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

Labor Bargaining on Trial!

During its rise to power over the last 25 years, labor has found it relatively easy to get concessions from management in the form of higher wages and collateral benefits.

Collective bargaining on new contracts has been a one-way street with labor doing all the driving. But current developments indicate labor may have turned up a dead-end street.

Negotiations between the steel industry and the United Steelworkers of America over the last five months have probably put collective bargaining on trial.

In the belief that inflation is the fundamental issue, the steel industry has insisted on a noninflationary contract. Its representatives are holding out for revision of local work rules to permit increased efficiency. Only then are they willing to grant economic concessions—an improvement in collateral benefits this year and modest wage increases next year. They also want the escalation clauses tied to the cost-of-living index to be abolished.

USW President Dave McDonald has stood pat on a package with all the inflationary attributes of the one he got in 1956. Cumulatively, that contract cost the steel industry 85 cents an hour.

The impasse in steel, of course, stems from the fact that there is no way to force management and labor to agree.

Even the national emergency provisions of the Taft-Hartley Act provide no assurance that workers will not go out on strike again after working for 80 days. To the unions, Taft-Hartley is a strike breaking measure.

This much is clear: Unrestrained power in the hands of labor, contrary to the wishes of the rank and file and without regard to the public interest, can put a blight on our economy which we can ill afford.

As a result, Congress already is casting an eye toward restrictive legislation that could mean the end of collective bargaining and perhaps the establishment of basic industries like steel as quasi-public organizations, such as the railroads.

Neither management nor labor should want such action.

Irwin H. Such
EDITOR-IN-CHIEF

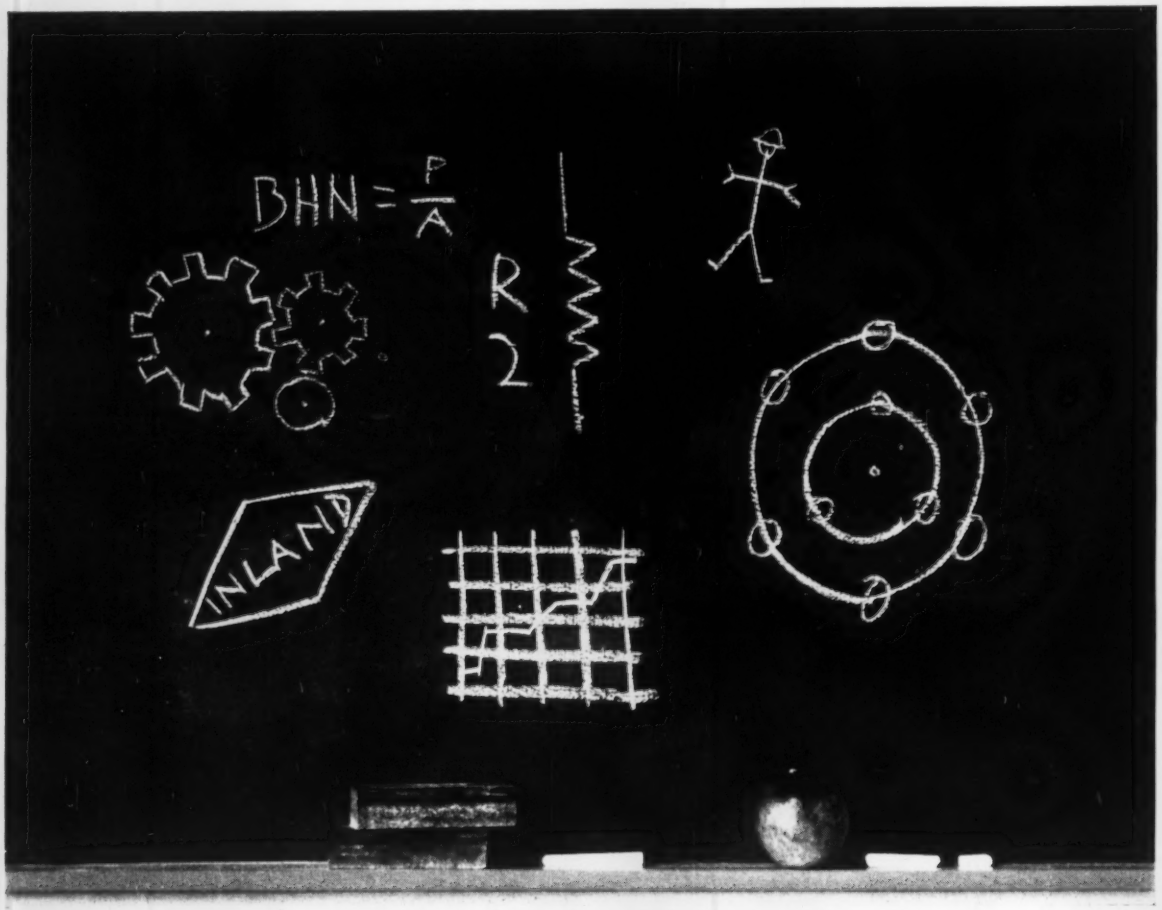
14,089 Inland employees went to school last year

Many went because they were enthusiastic about their jobs—inspired by the advancement opportunities at Inland. Others went because Inland, ever on the watch for men capable of developing their abilities, sought them out—found them—encouraged them to take the next step.

At Inland, this thoughtfully planned system of seeking for such men within the company, has now been in continuous operation for more than fifteen years. Because of it, more than 70% of Inland's supervisory staff have come up from the ranks—30% more from Inland's College Recruitment Program. Because the system encourages personal growth, the process never stops. It may begin with on-the-job training programs in which 3,842 employees participated last year. It can continue through Inland's programs in conjunction with leading educational institutions, such as Harvard, Purdue, University of Chicago and Wabash College.

With literally thousands of Inland men building their own futures, a new kind of climate is created—a climate in which men find real satisfactions in their work and the products of their labor. It results, we believe, in a growth-minded organization—a company dedicated to ever better service and products for every Inland Customer.

Building Today, with an Eye to Tomorrow



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Hard Steel Convalescence Ahead

Steel mills will need, on the average, six weeks from the time of settlement to hit 90 per cent or better of their shipping capacity. That's the six weeks of poststrike recovery when metalworkers will be hard pressed to keep healthy steel stocks

THE STEEL STOPPAGE—the strike that nobody wanted—is the most expensive in the industry's history.

Direct losses through Oct. 5 have mounted to $4,343,200,000. Add the indirect losses and the total could easily reach $6.5 billion.

• **Tough Convalescence** — Besides the 500,000 steelworkers who struck, another estimated 175,000 have been laid off as a direct result of the strike—mostly in coal mining and railroad industries. But the number laid off among steel users is growing.

Ironically, that total among fabricators will swell even when all the steelworkers are back on the job. The overwhelming majority of metalworking's 70,000 plants didn't have to curtail operations through Sept. 30, but more and more will have to now. The steel industry, on the average, will require six weeks from the day of the strike's end to reach at least 90 per cent of its shipping capacity—30 days to achieve that rate of ingot capacity (see Page 46 for startup procedures necessary in steel).

• **What to Expect**—Look for more severe shortages, generally, for the first 30 days after the strike than during the walkout. In ten days after the end of the stoppage, expect the start of shipments on orders placed just before or early in the strike.

Within 90 days of resumed operations, most orders will be filled that were placed just before or during the strike. Within 90 to 120 days, expect the start of deliveries on orders placed at the time of settlement.

• **The Product Situation**—The big pinch will be in sheets and strip. It'll be four to eight weeks before sheet mills hit 90 per cent or higher capacity. It will take 10 to 14 days longer to get cold rolled products moving out the door than it will for hot finished items. Sheet mills are booked solid for 90 to 110 days. Tightest products are the galvanized items—orders for them are huge.

Some plate producers figure they can reach 95 per cent of capacity operations on plate mills in two to three weeks after a settlement. But that rapid start won't make up for the order jam they face. Backlogs of three to four months are common. Supply of sheared plates, particularly from 100 in. and 160 in. mills, will be tightest. Heavy gages will be scarce.

In oil country goods, hardest to get will be 4½ to 5½ in. casing, 2⅜ and 2⅞ in. tubing, and "spaghetti," the smaller sizes in tubing.

Mills can whip up to 90 per cent operations on structural facilities in two weeks or so, but they're booked solid for 10 to 12 weeks on most products, longer on wide flange beams.

It'll take about a month to attain 90 per cent operations on hot rolled bars.

Mills report they are booked solid for two months and, on some varie-

Strike Losses

(Through Oct. 5)

Lost Steelworker Wages

$853,200,000

Lost Sales

$2,478,000,000

Lost Production (ingot tons)

23,497,300

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

$472,000,000

Tax Losses to U. S.

$540,000,000

ties, for more than three months. In the Chicago area, the larger sizes (over 3 in.) will be particularly hard to get.

Expect supply of all sizes of cold finished bars in the popular grades to be tight until yearend.

The delivery problem will be less severe in pipe than with most other items. If you place an order today, you will probably be able to get delivery of seamless pipe within 60 days of the strike settlement. Orders placed earlier will be shipped before then. Exception: 2 to 4 in. sizes, which will be in short supply for the rest of the year. A few items will be available in two weeks after the settlement.

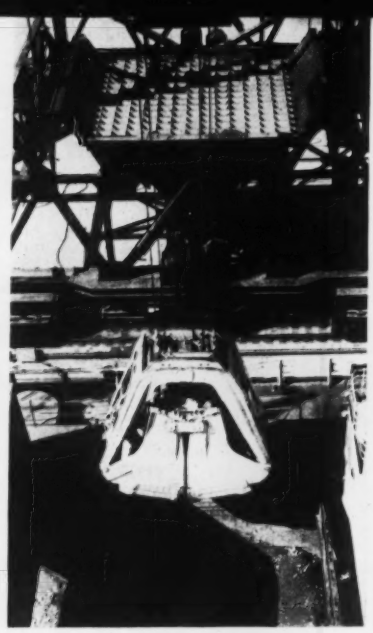
Tool steels will be readily available within six to eight weeks after the mills resume operations. Reason: Several tool steel producers have continued operating during the strike. Also, some of the companies on strike have substantial quantities of in-process material that can be released for immediate shipment after the settlement. If there is a shortage of tool steel, it will be in the carbon and oil hardening types.

• **Premium Price Market** — STEEL finds increasing evidence of an organized premium price market in steel. Brokers from Chicago and New York, especially, are offering material, particularly the precoated items. But most of the high cost material is moving in an unorganized way—hard pressed steel users themselves find the metal and persuade the fortunate owner to part with it.

Premiums are also being paid for conversion steel, particularly in the automotive industry (for motordom's steel situation, see Page 63).

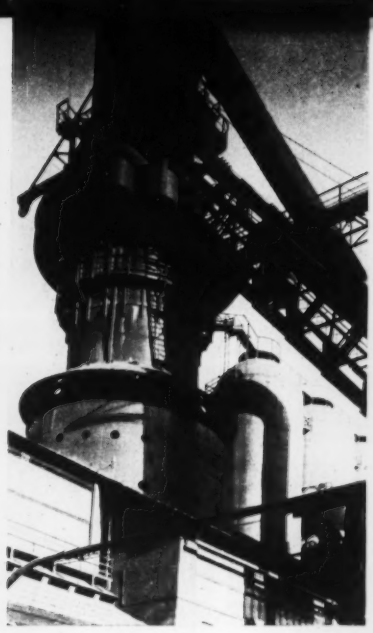
• **Damaged Facilities?**—Still a question mark is the extent of damage to idled facilities. The foregoing estimates assume that it won't be abnormal.

One sidelight: Republic Steel Corp. sought in vain to persuade the United Steelworkers to allow maintenance people in during the strike to start repairwork. Management reasoned that such an action would be to labor's advantage, as well as the company's, because the operating crews could get back on the job sooner. But the union turned the idea down.



Iron Ore

Ore can start moving immediately into stockpiles for winter, spring operations



Blast Furnaces

After repairs, banked furnaces can produce first casts in one to three days

Starting Up the Mills:

STEEL MILLS, on the average, will take 30 days after the strike ends before they'll be at 90 per cent or higher ingot operations.

With luck, including a minimum of equipment failures, some basic steelmakers could hit 90 per cent of capacity within two weeks of recalling workers. But prior to that, they will have to round up crews to repair facilities which deteriorated during the long walkout and gradually bring ovens and furnaces back to producing temperatures.

• **Full re-employment doesn't come automatically on the first day of startup.**

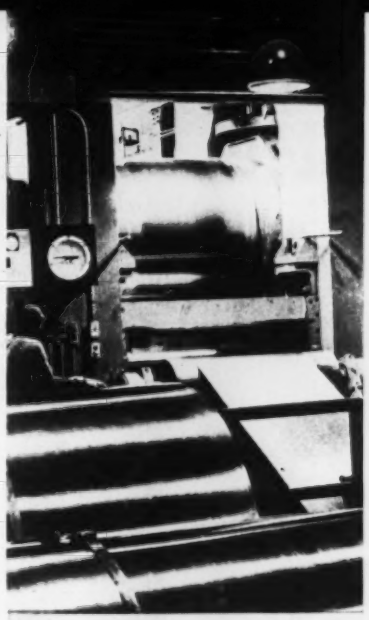
Full turn crews may take weeks to assemble while workers straggle in. One reason: The job of starting up is hard and dangerous work. Open hearth roof and blast furnace failures are some of the hazards of early operations.

The companies will be able to start up their soaking pits and blooming mills within 48 hours after workers return. Some cold pits may require new bottoms, accounting for more downtime. Most mills stockpiled a number of ingots before the walkout, so they have enough raw steel on hand to begin operations without waiting for blast furnace and open hearth cycles to get underway.

Jones & Laughlin Steel Corp. is one major producer that probably got caught short. A rash of wildcat strikes in its open hearth department at Pittsburgh just before the general walkout crippled its attempt to build a backlog of ingots. In addition, it will probably have excess finishing capacity in the early stages of production. As a result, the company is in the market for conversion steel once the startup begins. Ohio River Steel Div., Louis Berkman Co., may be able to help. President Louis Berkman tells STEEL: "We've got to take care of our own needs first, but we'll un-

Open Hearths

Initial heats must be adjusted for a week or more before quality steel is flowing



Finishing Lines

Steel stockpiled before the strike will go into mills in a few hours after startup

How Steel Goes to Work

doubtedly have some surplus ingots for sale."

• Conditions vary, but most coke ovens which were allowed to cool during the strike will be ready for charging about 4 hours after firing. The first oven will be pushed about 24 hours later.

Unsealing and rebricking blast furnaces may require 16 to 24 hours, depending on repairs needed. After air is introduced and hot blast stoves are started, another 16 to 20 hours may elapse before slag is molten and flowing to heal breaks in the furnace. Ten to twelve hours later hot metal will be ready for the open hearths. Electric furnaces will be back in production almost immediately.

A full week, or more, may be required to get cold open hearth furnaces back to normal production. After repairs are completed, they will be heated up slowly. Initial heats are started with high quality scrap; the charge is heated about 24 hours before the first tap can be made. One producer finds that early heats are so low in carbon and high in manganese that some product lines are held up until the right quality of steel can be tapped.

• Startup timetables can also be thrown out of kilter by collapsing open hearth roofs, blast furnace breakouts, or other mishaps.

Finishing mills can usually be operating within a few hours after the crews get back.

In all, repairs and startups will take at least two weeks. In 1952, the industry hit 42 per cent of capacity in the first week after the 53 day strike ended. In the second week, production neared 90 per cent of capacity, but full capacity was not reached for another five weeks.

Steel buyers can't expect the delivery situation to clear up the minute production hits a high level. Supply pipelines from the mills were virtually emptied by the strike and will require refilling before any products appear at the customer end. In previous strike years, some plants have had to close their doors because of steel shortages weeks after the settlement.

• Even with a respite from the strike, steelmakers will still have headaches.

The critical question of iron ore supplies will hound the industry through the winter. Ore movement on the lakes will begin quickly after a strike truce. Some vessels are loaded now, so stockpiling can start right away. Also, some ore is stockpiled at the head of the lakes, so loading will not have to await mining and hauling of ore to the docks.

Steelmen are worried, though, that shipping may be halted by bad weather before December, with resultant shortages by early spring. Current stockpiles (about 47.5 million tons) are about even with prestrike stocks but are well below the third quarter levels of recent years (STEEL, Sept. 28, p. 79).

If ore movement is curtailed, whether by strikes against East Coast ore importers, or weather, or a nationwide railroad strike this winter, steelmen will have even more production crises to face.

Strike Ups Aussie Exports

The U. S. steel strike has boosted the export of Australian steel, reports John McEwen, minister of trade. Mr. McEwen said sales of tubes and pipe to the U. S. will reach 40,000 tons this year vs. 35,000 tons in '58. Heavy domestic requirements prohibited the export of sheets.

Metal Salvage Work Begins

An estimated $75 million worth of metals will be salvaged by Isthmus Steamship & Salvage Co., Miami, Fla., from the holds of 40 ships sunk in U. S. waters during World War II, reports Capt. Robert J. Stefanich, president. The first job will be started next month—recovery of a $4 million metal cargo from the American flagship *Bayard*, sunk in the Gulf of Mexico in 1942.

Isthmus has spent $125,000 since 1949 to locate the ships and to secure options for the salvagework.

Why Detroit Steel Buys Marketing

V. R. Bates, vice president—marketing: "Marketing is planning for sales. To sell successfully, know what kind of steel your customers want, plus when, where, and how they need it."

T. R. Adams, vice president—commercial: "Try to anticipate customer needs. Customer satisfaction is the sales objective that results in continued long term profits."

WHEN TWO MEN such as Messrs. Bates and Adams are talking like that you can bet their company either has got into marketing or is about to make such a move.

Detroit Steel Corp. set up its marketing organization late last year to meet the demands of expanding business. Rather than adopt any specific corporation's formal marketing plan, DSC adapted the marketing concept to its own size and aims.

Why DSC went into marketing and how its setup works may give you some tips on building a marketing staff of your own.

• Detroit Steel was founded in 1923 to supply cold rolled steel strip to Michigan's automotive industry.

As business grew and the firm's capacity increased (it's now 900,000 ingot tons), DSC added other hot and cold rolled flat and wire products, rods, and reinforcing mesh. Automotive and appliances still account for a third of the firm's tonnage, but other markets include construction fields, furniture, and agriculture equipment.

Plants in New Haven, Conn., Portsmouth, Ohio, and Detroit serve the eastern half of the country and parts of the Southwest. Net assets have more than tripled since DSC became an integrated mill in 1950.

As the company grew, more of the market research, product development, planning, and distribution work fell upon the sales staff.

• Last year, the company decided it was time to form a marketing team to take some of the pressure off its sales force and to help put new product and market plans into action.

Mr. Bates moved from head of sales to the newly created post of vice president - marketing. Tom Adams, in charge of eastern operations, returned to Detroit headquarters as vice president-commercial, to supervise the sales force and to execute marketing policies.

Policies are determined by a top management group which includes President Max Zivian, Executive Vice President Howard Clark, Messrs. Bates and Adams, and the product sales managers, Lloyd Martz (flat rolled) and Jim Sutherland (rod and wire products). E. B. (Bart) Mason, commercial research manager, services both marketing and sales in market research and product development.

• Joint administration at DSC avoids the rigid chain of command which sometimes clogs the flow of communications in larger firms.

In effect, the two vice presidents are at the small end of a funnel that receives reports and information from all departments in the company. They can draw upon

each other's staffs for any information they may need. Mr. Clark acts as liaison among marketing, sales, and production departments.

DSC's command group is flexible, but it is not committee management. Each executive has definite responsibilities and can make decisions as he goes along. Because of a policy of continuous communications among the offices, Mr. Clark needs to schedule only one formal meeting each month.

Mr. Bates likens DSC's marketing setup to the military concept of strategy and tactics. "Strategy comes first. It's the evaluation of the company's ability to meet customers' product and service needs as well as the evaluation of the strength and location of our sales forces and those of our competitors. Tactics determine how we can deploy our sales forces to best advantage."

• The marketing setup already is paying off.

As far back as 1950, DSC started looking at the Southwest as a potential market area. It wasn't equipped to move then. Says Mr. Bates: "We could have gotten into some sort of hit and run operation, but this would do us more harm than good in the long run because we wouldn't be able to satisfy our customers."

Following a two year survey, Mr. Mason reported the southwestern markets could use DSC sheet steels for welded tubular products and other articles manufactured from flat rolled steel and wire. The formation of the marketing group took some of the pressure off sales and the company moved into several new territories.

A district sales office was opened in Houston last December. At first, buyers were surprised that a Detroit firm would move so far south to sell steel, but as Mr. Mason points out: "Competitive freight costs, not distance, are the basis for profitable market development. Barge rates on sheet steel, for example, from the company's Portsmouth, Ohio, plant to Houston are almost equal to corresponding rates from steel producers in Illinois and Alabama. Rail and truck rates from Detroit are competitive for cold rolled carbon strip and spring steel."

• Today, Detroit Steel is operating at near capacity levels on an indefinite labor contract extension. Its profit outlook is excellent. With its marketing group underway, it is concentrating on a new five year expansion program.

Net earnings this year should be close to $10 million compared with $1.1 million in 1958 and $3 million in '57.

Installation of oxygen lances in five open hearth furnaces is expected to boost 1960 ingot capacity to 1.2 million tons.

In the works are further expansions in ingot capacity, finishing facilities, and new products.

The company is considering initial expenditures of $20 million to $25 million to diversify product mix, expand existing markets, and open up new markets.

Asserts Mr. Bates: "You can't expand until you know that the expansion will enable you to satisfy the customer you already have as well as the new ones you'll be acquiring."

Adds Mr. Adams: "You can't sell in a vacuum. That's why marketing is at the heart of our company's growth. Marketing tells us which way to go; whether to add new products or go for new markets for existing products; or to go for new customers in new markets, or get more participation in the requirements of existing customers."

Mill Automation Up

Iron and Steel engineers are looking for big benefits from process control in every phase of steelmaking.

Automatic control systems are already successful in blooming, slabbing, and hot strip mills. They're used for electric power regulation and gas mixing. Blast furnaces aren't automated yet, but they eventually will be. Those and other applications in steel mills were discussed last week by engineers at the annual convention of the Association of Iron & Steel Engineers in Chicago.

Feedback gage control for hot strip mills has been developed by the Control Dept., Allis-Chalmers Mfg. Co., Milwaukee; automatic slabbing and blooming mills were described by engineers of Inland Steel Co. and U. S. Steel Corp.

Blast furnace automation is on its way in an automatic system for assembling and charging of raw materials. It was described by John F. Meissner, president of Meissner Engineers Inc., Chicago.

The need for well trained personnel to keep electrical, mechanical, and hydraulic components of automated systems in repair was stressed by R. J. Byrnes, Cutler-Hammer Inc., Milwaukee.

N.Y. Steel Shortage Cuts Drum Output

SERIOUS SHORTAGES of steel drums and containers are developing in New York as fabricators start scraping the bottom of their steel stocks.

One drum manufacturer, forced to close his doors for lack of steel, believes it will be six weeks after steelworkers return to the mills before he will start receiving a dependable supply of steel.

He doubts that he will be able to resume operations much before that time.

• Strike Irony—A number of captive shops in New York and nearby areas which are shut down by strikes will actually be in a more favorable position when the steel strike ends. They had good supplies of steel at the time they were struck.

One large buyer of containers is receiving only 30 per cent of his usual requirements; another is said to be in even shorter supply.

Although container shortages may be exaggerated by some buyers who are trying to stretch out their inventories, there is no doubt of an acute pinch.

One producer has had to reduce his work from a double to a single shift and believes his steel stocks will be completely gone by the middle of October.

To meet pressing customer demands, manufacturers have had to resort to unusually wasteful fabricating methods to step up output; some have obtained customer permission to substitute gages for those in short supply.

Productivity: Consider the 'Other 40%'

Paperwork: An Old Curse . . .

"If I attempted to answer the mass of futile correspondence that surrounds me, I should be debarred from all serious business of campaigning. I must remind your lordship—for the last time—that so long as I retain an independent position, I shall see that no officer under my command is debarred by attending to the futile driveling of mere quill driving—in your lordship's office—from attending to his first duty—which is, and always has been, so to train the private men under his command that they may, without question, beat any force opposed to them in the field."
—Duke of Wellington.

INEFFICIENT paperwork can hurt you as much as inefficient operations in your plant. Not only that, office productivity will become increasingly important because the office work force is growing faster than the factory work force.

Another angle: In manufacturing industries, about 10 per cent of the sales dollar goes for productive labor, 40 per cent for materials (including handling), 40 per cent for organization and policy matters, and 10 per cent remains for profits before taxes.

Charles J. Berg Jr., director of systems and methods, Westinghouse Electric Corp., says: "For years, industrial engineers have been improving the efficiency of productive labor, generally. We can't do much more in that area short of complete automation. But consider what a potential there is in the organization and policy area, where a large per cent of the sales dollar is spent."

• **Potential Is There**—Can you measure what whitecollar workers produce? Mr. Berg replies with a resounding "Yes." He lists these techniques: 1. Estimates of how much a worker can produce. (The individual or his supervisor does it.) 2. Keeping records of completed work (maintained by the individual). 3. Observation by a systems and methods expert. 4. Use of standard time data.

• **Establishing Standards**—Earl R. Lind, manager, Office Standards & Methods Div., Joseph T. Ryerson & Son Inc., Chicago, reports his firm began a formal clerical work study over six years ago. It wanted to learn: 1. The relationship of the staff to the work. 2. The exact workload. 3. How the work was done. 4. How well it was done. The aims: Find out what work was necessary, and if it was done in minimum time with minimum effort.

Ryerson used time standards furnished by a consultant. A common definition of standard time: The time it takes a well trained, competent person to do the work under normal conditions. (Practice allows 15 per cent for personal time, including rest periods, fatigue, and unavoidable delays.)

• **What's a Good Job?**—You can't hope to achieve perfection, experts admit, but any department that's operating at better than 90 per cent of capacity is doing a pretty good job. Conditions conducive to such a score: 1. A clean place to work with good lighting, not too much noise, and no offensive odors. 2. The right equipment. 3. Capable supervision.

The formula for arriving at a percentage of effectiveness: Count the number of orders to be processed over a given period and multiply by standard time required per order. Relate the result (standard man-hours) to the time actually spent. Compare the number of persons

working in the department during the period with the number standard time data call for.

• **Red Tape: State of Mind**—"Office paperwork should be fought on two levels—attitude and mechanics," notes Harry H. Fite, vice president, Lester B. Knight & Associates Inc. (He is manager of the firm's Washington office and a contributor to the Small Business Administration's "Management Aids" series.) Your officeworker's attitude is the best place to begin.

Mr. Fite thinks poor office productivity usually stems from a red tape state of mind, which he defines as:

• Insistence on multiple reviews of instructions, orders, or letters.
• Use of committees for approving routine action.
• Lack of established operating procedures and standardized means of communication.
• Disregard of new methods and machinery.
• Devotion to detailed reports.
• Continuance of records that are "dead but not buried."

Improvements in mechanics can be made with studies like those recommended by Messrs. Berg and Lind with better supervision, more thorough training, and work simplification programs.

• **Take Worker into Partnership**—A basic concept is to train the employee to recognize problem areas. Mr. Fite recommends the technique as a certain morale booster.

Top management support for any simplification effort is a prime requirement. Oral and written evidence of management's interest must be continuous.

The organizational structure should include one person of high rank who is personally responsible for the program's success, if the company is small or highly centralized. In the case of a firm like Westinghouse, Mr. Berg believes "system and method improvement should be a staff function independent of line operations, so that people doing the work can bring an unbiased opinion to all the line management they serve." Mr. Berg's people are stationed at Westinghouse plants on a semipermanent basis: "We're sort of a captive consulting firm."

• **Business Machines**—To gain understanding of your business machine needs, Manpower Inc., Milwaukee, suggests this checklist:

1. Develop a machine utilization survey to see if you have maximum use of office equipment.
2. Compare the advantages of leasing with ownership.
3. Maintain a central inventory of equipment so you can transfer machines to other departments.
4. Establish standards of use to determine when machine purchase is justified.
5. Prepare manuals on maintenance and repair for your employees' use.
6. Obtain estimates on major repair jobs. It may be wiser to replace with the latest model, rather than repair the old one.
7. Maintain repair records. Consider your own service department if the firm is large enough.
8. Record guarantees.

Utilization of electronic computers in business is spreading phenomenally. You should consider computer service centers, as well as outright ownership or leasing. C-E-I-R Inc., Arlington, Va., reports it is setting up the first "nationwide" chain of large computer service centers. International Business Machines Corp. 7090 computers will be installed in three cities next year: Washington in June, New York in November, and Houston in December. Dr. Herbert W. Robinson, president, reports the service center plan is "the only answer" to the dilemma facing business: New machines will be so fast, and so expensive that they must be operated

Methods Improvements Require:

Systematic analysis of:

- **Job content.**
- **Work flow.**
- **Functions to be done.**
- **Programs underway.**

Objectives of a program must be:

1. **To reduce the work of each section to the essential by—**
   a. **Eliminating unnecessary work.**
   b. **Simplifying essential work.**
2. **To establish accurate personnel requirements for each section by determining—**
   a. **The indexes that measure the workload.**
   b. **The number of employees required to process the workload.**
   c. **The type of employees required (skills).**
3. **To improve the effectiveness of employees in each section through correct classification of each job.**
4. **To improve budgetary procedure by providing standards for the forecastings of personnel needs.**

Source: Westinghouse Electric Corp.

all the time to justify themselves.

Before considering expensive equipment, warns Mr. Fite, the firm must solve some of its work simplification problems because: "It is a waste of time and money to run needlessly complicated information through a computer."

• The Payoff—Mr. Lind says Ryerson's efforts to improve office productivity increased the average department's performance from a rate of 65 per cent at the beginning to 95 per cent or better today.

Mr. Berg notes a Westinghouse purchasing department in one year reduced the number of employees required for an efficient operation by 32 per cent, the payroll by 33 per cent, and the floor space by 26 per cent. He adds: "For every $1 we've spent for a man who does systems and methods improvement work, we've returned about $8 to the company."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Hurdle Ifs, Nicaro's Yours

Buyer will have problems but potentials look well worth the risks. Nickel operation profitably and efficiently managed but politics surrounding it were often stormy

WANT TO BUY a nickel plant?

Within the next few months some private group may walk off with the government's multimillion dollar nickel producing and processing complex at Nicaro, Cuba, if the General Services Administration gets what it considers a fair offer.

• **What's for Sale** — A metallurgical extraction plant with a capacity of 54 million lb annually; ore reserves estimated at 32 million to 35 million tons; tailings; mining and ore transportation facilities; laboratory; pilot plant; shops, warehouse and storage installations; transportation facilities (including a standard gage railroad), aircraft landing strip, a harbor that can accommodate vessels up to 12,000 tons; a town site that can house 3000 and includes hospital, theater, store, and utilities.

• **How Much**—In the last 17 years, the U. S. has poured close to $100 million into Nicaro. At today's prices, it would cost considerably more to duplicate. It's unlikely government people responsible for disposing of Nicaro will be too adamant about realizing the entire investment. There's too much pressure for the government to get rid of what many consider a troublesome "white elephant."

Consequently, odds are good an offer of $72 million or $73 million will be snatched up if the bidder can meet requirements of competence and if the sale is approved by the Justice Department.

• **History**—Over the last few years, Nicaro has been a political football and the cause of Congressional investigations, forced resignations, charges of incompetence and favoritism, hints of improper conduct.

Nicaro began as a war baby in March, 1942, when ground was broken for the processing plant. From December, 1943, until March, 1947, around 63.5 million lb of nickel oxide powder (77.6 per cent nickel) were shipped to the U. S.

The plant was declared surplus in mid-1947 but disposal negotiations sputtered and fizzled for three years. When the North Koreans marched across the 38th parallel, the Department of Defense instructed GSA to reactivate Nicaro. In January, 1952, a contract to operate the reactivated facility was given to a Dutch company which formed Nickel Processing Corp. Later in that year, National Lead Co. took over 74 per cent of the stock in Nickel Processing, Cuban interests the other 26 per cent. The situation has remained static since. In the last seven years, Nicaro has turned out 240 million lb of nickel.

• **Metallurgical Advances**—Nicaro's initial product (nickel oxide powder) went almost entirely to stainless steelmakers. It had several disadvantages, the main one being the high melt losses. With the ending of World War II in 1945, metallurgists set out to correct those faults. The result: A nickel oxide sinter obtained by mixing No. 4 anthracite coal with the powder. That hikes nickel content to about 90 per cent.

• **Potentials** — Government people who have lived with Nicaro are enthusiastic about its prospects. While most production now goes to the steel industry (with small amounts to ceramics), it's believed the iron content can be brought down to where the plating industry will become a market for Nicaro nickel. Proponents also think Nicaro ore can eventually be refined for nickel-base alloy use. Advantage: Sinter is selling for 4.4 cents a pound less than electrolytic nickel.

So far, metallurgists haven't been able to reclaim the high iron content (40 per cent) in the Nicaro ore. Sources close to the project think that will eventually become commercially feasible.

• **Still to Be Resolved**—Don't get the idea that the company that buys Nicaro won't have problems.

First, it will have to reach some sort of an understanding with Premier Castro's on-again, off-again government so the twin-edged threat of excessive taxes and nationalization won't always be hanging over its head.

Another problem: The hassle that has been going on for some time between the government and Freeport Sulphur on ore contracts between the two. Nicaro's purchaser will inherit the contract that allows or commits it (depending on your point of view) to take one-third of the ore it uses yearly from Freeport properties until 1968 (in practice, the government has been buying more than the contract calls for).

Auto Rundown: Ford, Falcon, T-Bird

Ford Div. expects to make 1.6 million cars in 1960, 25 per cent of which will be Falcons. Ford line is completely restyled. Steel supplies will hold through Nov. 15

MOTORDOM says it will build 6.3 million cars in 1960. Ford Div. hopes to build and sell 1.6 million of them. Some 25 per cent will be Falcons, another 5 per cent will be Thunderbirds, and station wagons will account for 20 per cent of the regular Ford production, says James O. Wright, division general manager.

Mr. Wright figures his division will have 13,000 Falcons completed by this week's introduction date. He hopes to have 97,000 of the compact cars turned out by Jan. 1. The division has enough steel to last through Nov. 15 at present scheduled production rates.

• **Prices Stable**—Mr. Wright says 1960 prices should be about the same as 1959's. He claims Falcon will offer the lowest price six passenger sedan in the industry. The tab will be below the Corvair's ($1810) and the Lark's ($1793). It will not be cheaper than Rambler American, which Ford considers a five passenger automobile.

Ford will offer the Fairlane, Fairlane 500, and Galaxie in its regular series. Custom Fords are gone for good. Wheelbase is 119 instead of 118 in. Trunk capacity is less than 1 cu ft smaller than in this year's models.

The cars have 1 in. more legroom in front and rear. Shoulder room is 3 in. greater in front, 4 in. in rear. Even though the cars are 55 in. instead of 56 in. high, headroom is a fraction of an inch better than the 59's. The engine lineup is virtually unchanged, although V-8 horsepowers are slightly lower.

This will be the last year for 81.3 in. wide cars. Next year, Ford will return to maximum widths of 80 in. The Skyliner hardtop is discontinued. The company is concentrating on hardtop and convertible T-birds. A Thunderbird with a sliding sunroof is also offered.

• **Other Changes** — Except for Thunderbird, Ford lines have undergone a complete skin and chassis change. Rear quarters are flat and the blades look more like Chevy's fin line. The trunk lid is narrower. Windshield pillars have been changed to eliminate bruised knee-caps. Bull's-eye taillights have been dropped in favor of a half moon design with aluminum bezels. Track width is 5 ft on front and rear wheels. Rear leaf springs have been lengthened to 5 ft which also helps rideability. Brake area has been increased 30 per cent.

In reducing Falcon weight, Ford has adopted a one piece cast head and intake manifold. Weight: 53 lb. Conventional six cylinder engines still have a separate head and manifold weighing 98 lb. All cars but Falcon have adopted the T-bird radiator treatment which takes the top surge tank off the radiator and mounts it separately to the side. The radiator is a crossflow job, permitting lower hood height.

• **To Export Falcon**—The International Div. is interested in exporting Falcons. Mr. Wright says that group has earmarked about 5 per cent of the initial output for world markets.

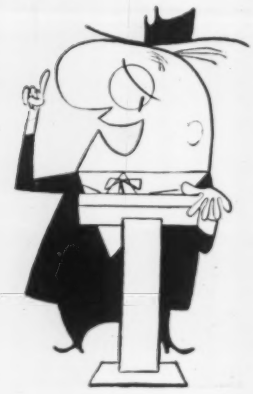
Asked if Ford plans a small type van truck, Mr. Wright responded with autodom's stock reply: "We're studying the market closely and intend to be competitive."

• **Turbines for Trucks**—Gas turbine engines will definitely be used in trucks within the next decade, says Dr. Donald Frey, Ford Div.'s engineering director. Dr. Frey believes more plastic will be used for interior trim within the next three to five years. Ford sources also told STEEL that its newly developed high tensile strength steel (STEEL, Sept. 21, p. 84) will knock up to 300 lb off its cars within the next few years.

Above are two views of the Ford Galaxie for 1960. Like the Fairlane and the Fairlane 500, the other series in

Ford's line for the new year, the Galaxie is 213.7 in. long and 55 in. high vs. 208 in. and 56 in. in '59

Business Has Bigger Job in '60 Congress



BUSINESS failed to look out for its own interests in the first session of the 86th Congress, charges Rep. Thomas B. Curtis (R., Mo.). He offers some timely advice on how to do a better job in the second session, beginning in January, 1960: "I think greater political activity is necessary for those who believe that better economic decisions are reached through the interplay in a free and competitive market place, rather than through bureaucratic planning and decision . . ."

He believes major blows against the free enterprise system were struck this year by the passage of three measures by Congress: 1. The increase of taxation on the life insurance companies by about 90 per cent. 2. Extension of the Renegotiation Act. 3. The cut in the excise tax on telephones. Those three measures appear to be limited in importance to only the insurance industry, aircraft manufacturers, and telephone companies. But Representative Curtis makes a case for the larger view.

Social Security Costs May Skyrocket

More taxes on the life insurance companies, he argues, will hamper their ability to provide for the retirement of people and spread the risk of death and disability. In turn, the social security system will have to be expanded to do what private enterprise can't do. He predicts Congress, in an election year, will not be able to resist the pressures to raise the base wage upon which social security taxes are figured and extend coverage to hospitalization and medical costs.

Renegotiation Destroys Competition

Extension of the Renegotiation Act, he believes, sets the climate for doing business with the military, the biggest federal spender for goods and services. He says the act is not in accord with the principles of free enterprise and tends to destroy competition. It provides that the government may review and order revisions in company profits resulting from defense business.

Constitutional Rules Were Violated

He likens the reduction in telephone excise taxes to a cut in freight excises in 1958. The cuts themselves are not bad, although they represent areas where "the most political pressure was generated." What is bad is that they were granted in lieu of a wholesale reform in our tax structure.

Furthermore, the young Missouri Republican believes: The action was "at the sacrifice of important constitutional and Congressional procedures which call for all tax legislation to originate in the House. The excises were cut by Senate amendments to House tax bills on other subjects." Congressman Curtis notes another amendment almost got through in the same way: One intended to eliminate the stock dividend credit. He implies that the House Ways & Means Committee, where tax bills are supposed to start, will protect business.

Legislation Depends Upon the Economy

Looking to 1960, he thinks that some legislation which specifically affects business will be passed.

- He sees no hope for tax revision or reduction.
- Congress will take the interest ceiling off long term federal bonds, thus tending to ease the inflationary trends a little.
- Standby controls over credit and some prices are likely if inflationary trends pick up steam. (Although the President would probably veto such a measure, Congress would override him.)
- Federal expenditures will continue to rise, although "bookkeeping" techniques will keep the "semblance" of a balanced budget.
- Tax treatment of foreign investments will probably be liberalized a little but not as much as has been hoped.
- Unification of military procurement activities is a possibility, but the military will remain in competition with private enterprise in many areas of procurement.
- The minimum wage will be increased and its coverage broadened.
- Competition from imports may cause some liberals on Capitol Hill to slightly revise their attitudes toward "free" trade and the questions of tariffs and quotas.
- The pressure will be great to federalize the unemployment compensation program.

On the subject of taxes, the congressman talks this way: "Until the Treasury Department learns that there is such a thing as a law of diminishing returns in taxation and looks at each proposed revision from the point of view of how it might help the economy grow, rather than how it might cut tax revenues over the short run, we will remain in trouble. If basic tax reform does not come soon, we are going to have another recession, largely as a result of our tax structure," he warns.

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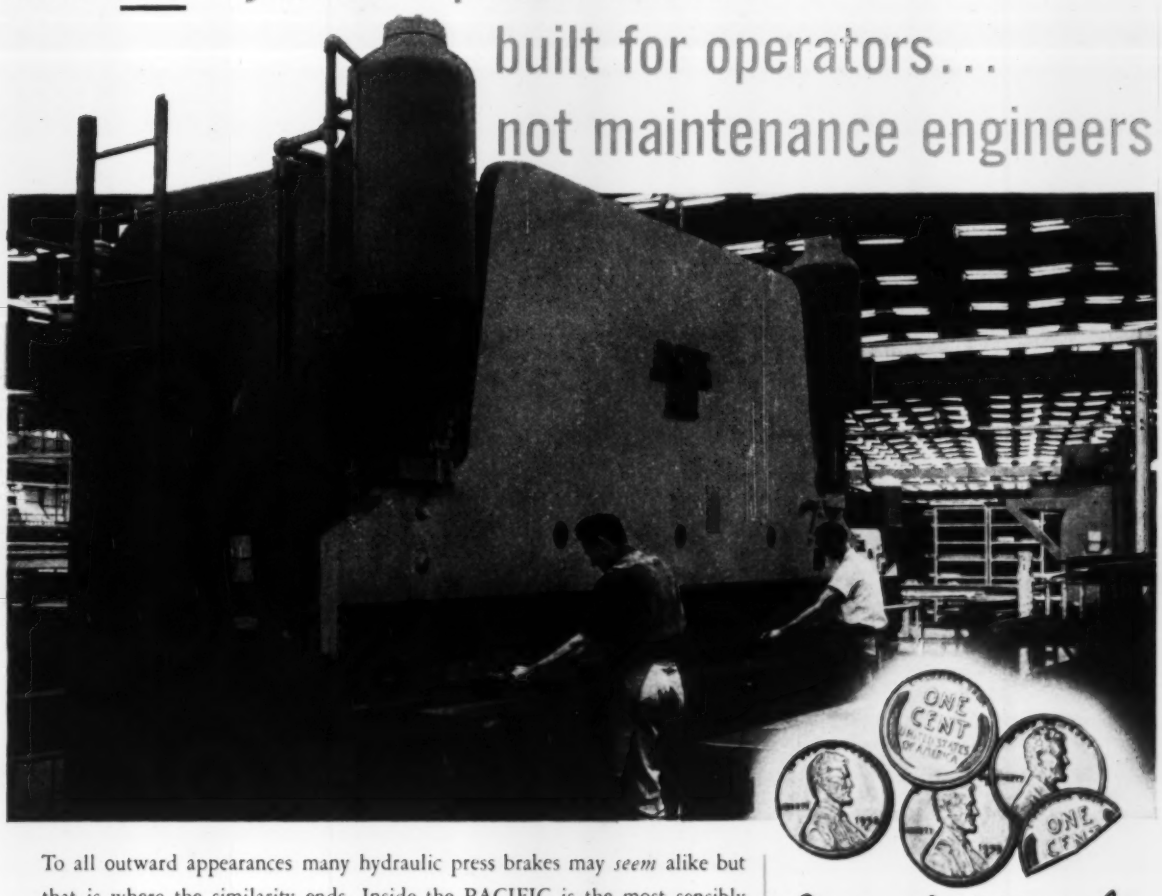

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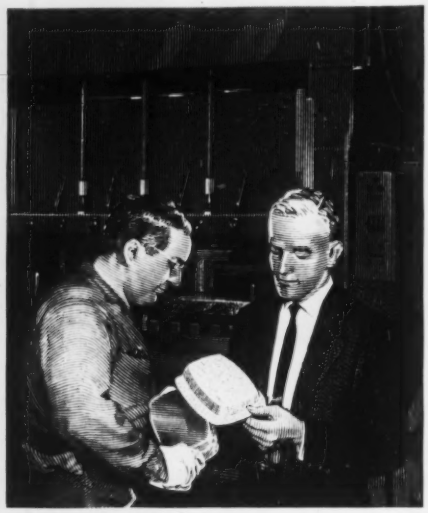

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Sweet Sound of Stereo Turns Up Hi-Fi Volume

STEREOPHONIC SOUND is adding volume to the already surprising high fidelity industry.

Stereo became a big consumer product last year when the first phonograph discs became practical. Before that, it was available only to the owner of an expensive, multi-channel magnetic tape recorder. A retailer of high fidelity equipment tells STEEL stereo equipment sales are outstripping monaural sales 4 to 1.

• Sales of hi-fi components, a $12 million market in 1950, are gaining at the rate of $50 million a year.

The retail component market this year is estimated at $300 million by Abraham Schwartzman, executive secretary of the Institute of High Fidelity Manufacturers. Components like amplifiers, speakers, and changers are the fastest growing segment of the industry because the hi-fi hobbyist uses them to tailor his own system and also keep it from becoming obsolete.

• No one pretends to know the size of the hi-fi market, but the end of its growth is not in sight.

Sales and production totals are not available because the industry is broad and growing rapidly. Comparisons of year-to-year sales are not too useful because it is too early to measure the impact of stereo on the market. One authority tells STEEL that about 8 million new phonographs will be sold this year compared with 3 million units in 1953. He thinks sales will be 20 per cent higher next year, mostly because of wider acceptance of stereo.

Mr. Schwartzman believes sales of components will come to about $400 million in 1961, but he thinks they will level off within a few years and the market will become steadier. Industry authorities agree because stereo, like any innovation in entertainment, tends to "go over real big" in the early stages.

• Foreign producers are sharing in the boom, but U. S. manufacturers aren't too concerned.

Equipment made in England, Germany, and Japan is selling well here. Reactions of domestic producers vary from "there's enough of a market for us all," to "any demand for foreign equipment has about died out." A U. S. sales manager had this to say about the well established Garrard equipment made in England: "Hell, I've never thought of them as foreign competition."

• Hi-fi is a unique industry, created by a new kind of consumer.

Hi-fi hobbyists are a quality conscious lot. Manufacturers have been forced to continually improve their products. The industry is exceptionally ethical, says Joseph A. Higgins, product sales manager of Clevite Corp.'s Electronic Component Div., Cleveland. "We have a responsibility to the industry, and we are much aware of it," he says. Example: Clevite pioneered a stereo cartridge for its piezoelectric ceramic elements, but it kept on researching its product to get an even higher quality material. (In fact, Mr. Higgins is glad he doesn't have detailed engineering knowledge so he can ask his engineers for the impossible.)

• Steady growth for high fidelity is assured. Even more dramatic breakthroughs are on the horizon.

"We've just scratched the surface of this market," says one dealer. He foresees the day when consumer sets operated on tape will produce living-room motion pictures with stereophonic sound.

integrated CRUCIBLE steel service

Crucible inside account salesmen (1) simplify ordering and expedite deliveries of the steels you need, (2) arrange for handling extra services, (3) supply you with basic steel and metalworking data.

staffs 32 local warehouses with specialized personnel to solve your specialty steel problems

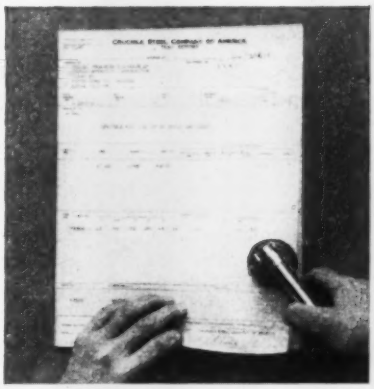
"We frequently rely on Crucible warehouse people," says one of our good customers. "We've found they can sometimes show us more economical steels, sizes and methods than those we're using. Furthermore, they give us valuable help with steels we're using for the first time."

This steel buyer, like thousands of others, believes in getting services with the steels he buys. Here's what he gets:

Crucible inside account salesmen help him simplify ordering, speed up his deliveries. They can efficiently arrange for extra services, such as forging, slitting, grinding and polishing, because of their special training at Crucible mills.

Crucible sales-service engineers give their production and toolroom people valuable metalworking assistance. They'll recommend machining speeds and feeds, quenching temperatures, the best forming and joining methods.

Behind these specialists are the resources of Crucible's entire, integrated operation – from mining the ore to steelmaking to warehouse delivery to you. Why not take advantage of these services each time you order specialty steels? They're available through every Crucible warehouse. *Crucible Steel Company of America, Dept. PJ15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



Need certified test reports for government work? Warehouses can supply the steels and notarized reports of analyses.

Trained, experienced sales-service engineers can help your engineers use steels that are new to you.

This is the easiest way to arrange for forging, flame-cutting — have the warehouse accommodations service do it for you.

STOCK LIST
Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel
ALLOY STEELS – Bars, billets, strip and sheet
COLD ROLLED CARBON SPRING STEELS
DRILL STEELS – Hollow and solid drill steels
ALUMINUM EXTRUSION DIE STEELS
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PERMANENT MAGNETS
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Corporations Step Up Aid to Higher Education

Here Are Guides to Giving . . .

$500 million

1969

$150 million

1959

$20 million

1948

DAVE'S FATHER DIED the year before Dave was graduated from high school. But he was able to get a degree from Yale last June. Reason: A General Motors Corp. scholarship. Dave's mother in Iowa wrote to GM: "You have made possible two university educations that otherwise could not have been." The lady was able to complete her own college work because of GM's financial aid to her son.

Such letters have warmed the heart of many a company executive, but industry has an even more important reason behind its financial aid to education. Alert executives realize that gifts to education are sound investments in the future. They believe that the money they pour into the educational pool will return to their companies in a wave of better qualified graduates — to work in their laboratories and offices, to be the future managers of their companies.

• **The Trend Is Up**—Those are the main reasons why more companies give more money to education every year. In 1958, for example, U. S. corporations gave $136.5 million to higher education—a record amount even though it was a recession year. This year, the figure will shoot up to $150 million, estimates Frank H. Sparks, president, Council for Financial Aid to Education (CFAE), New York.

Two developments have contributed greatly to the uptrend: 1. Russia's rockets blasted our national vanity and awakened us to the lag in our educational capabilities. 2. Industry faces a pressing need for managerial talent. Today's fast stepping technology often demands that executives in marketing and finance functions have technical backgrounds. That siphons off top talent from a pool already too small to carry on the research and engineering functions.

• **Finding Your Role** — Here are some guideposts you can use in determining how your company can assist in the educational effort.

• **Who Gives What**—A CFAE survey shows that the average manfacturing company contributes about 30 cents of its gift dollar to higher education.

The average manufacturer contributing to education gives 0.3 per cent of its net income before taxes. Compare your performance with others in your industry (the first figure represents the percentage of net income before taxes that went to education; the second figure represents the percentage of the gift dollar that went to education):

Chemical	0.47%	37.2%
Electrical machinery	0.36	34.2
Fabricated metal products	0.30	27.3
Nonelectrical machinery	0.26	23.5
Mining	0.48	30.1
Petroleum & coal	0.23	24.0
Primary metals	0.55	23.9
Professional & scientific	0 31	37.1
Rubber	0.32	26.7
Stone, clay & glass	0.45	40 7
Transportation equipment	0.62	41.0
Utilities	0.12	17.3

• **It's Deductible** — Explains Mr. Sparks: A company can deduct for income tax purposes 52 per cent of its educational gift, if the gift amounts to less than 5 per cent of net income before taxes.

• **Few Strings** — Most companies place few controls on the money they give to educational institutions; leading contributors believe their gifts are more useful if allocation is left to the discretion of the college administrators. A CFAE survey finds that the purposes of corporate gifts break down this way:

Unrestricted	34.1%
Building & equipment	16.9
Student financial aid	15.0
Graduate & professional education	11.7
Basic research	5.8
Departmental grants	3.2
Faculty compensation	3.1
Endowment	0.9
Other purposes	9.2

• **Who Gets It**—The bulk of corporate funds goes to private institutions, although about 1 in 3 donors gives to a publicly controlled school. About 1 in 4 firms allots funds to junior or community colleges; less than 1 in 5 gives to precollege establishments.

• **Guide from Clevite** — Clevite Corp.'s Clevite Foundation, Cleveland, has developed a new formal approach to the control of corporate contributions. It works like this:

Step 1. Establish a control group by choosing a list of companies in your area that publish financial reports and have a reputation for taking their contribution programs seriously. You'll use those firms' net profits as your standard. For companies with plants outside your area, use that portion of their net income that would equal, percentagewise, their employment in your area vs. their total employment.

Step 2. Ask each charitable organization you plan to aid for data on: 1. The amount of money it has received in a given period from each of the firms in your control group. 2. The amount it has received from all business and industry. 3. The amount it has received from all sources. This is an important step since you'll probably find that your local colleges receive more, percentagewise, from your control group than does the community chest, for example.

Step 3. For each charity you plan to support, you must: 1. Ascertain the total goal. 2. Evaluate the amount expected from industry. 3. Estimate, from the information you now have (from Step 2), the percentage of the industry support that must come from your control group. 4. Apply to that figure the percentage of the control group's giving that you've adopted as a standard for your company.

Example: Suppose a local engineering college has a building fund campaign. Its realistic goal is $1 million. You've learned (from Step 2) that 60 per cent of the support comes from industry and that your control group gives 50 per cent of the industrial total. That's $300,000. Suppose that your standard is 4 per cent of the control group. Your fair share is $12,000.

Step 4. Ask each company in your control group for the total amount it contributed to all causes for, say, the past four years. Compare that with their average net profits. Now you can compare your giving with theirs.

Compare Your Rate of Giving . . .

Industry & No. of employees	Average Contribution per employee
Electrical Machinery	
500-1000	10.24
1000-5000	3.37
5000-10,000	10.47
10,000-20,000	10.41
20,000-100,000	8.76
Over 100,000	5.71
Fabricated Metal Products	
Under 5000	6.84
5000-10,000	3.90
20,000-100,000	4.72
Machinery (except electrical)	
Under 5000	7.17
5000-10,000	2.70
10,000-20,000	2.48
20,000-100,000	3.42
Primary Metals	
500-1000	15.31
1000-5000	4.60
5000-10,000	5.94
10,000-20,000	4.69
20,000-100,000	10.60

Source: A Council for Financial Aid to Education survey of 352 companies.

• **Employment Approach**—Another Cleveland company determines how much it will give to a charity this way: It employs about 1 per cent of the Cleveland work force, so it figures 1 per cent of a campaign goal is a good starting point. Then it goes above or below that amount depending on how the particular charity affects the company, its employees, its customers, or any other company related group. A local engineering college would likely get more than 1 per cent of its goal from the firm, while a liberal arts school in the Far West would get less.

• **GM Likes Scholarships**—General Motors Corp. is a leading advocate of the industrial group that believes scholarships are highly effective. GM research, in 1954, showed that only half the high school students in the top 25 per cent of their classes went to college. So the corporation set up two elaborate scholarship programs.

First, it allocates 304 scholarships annually to institutions. The scholarships range from $200 to $2000 annually. The average: $974.

The other GM program is based on an annual competition. It works this way: Students apply for the scholarships when they take their college entrance exams. The top 800 (on the basis of test scores) are screened out. Each submits a report. GM also gets a report from the high school principal of each of the students. A 16 member committee then ranks the 800. Last year, 114 were given scholarships—to the schools of their choice. About 22,000 students applied. At present, 218 colleges have students on GM scholarships. A GM representative visits each annually and talks to all the scholarship recipients. Those at private institutions earn a bonus: GM gives their alma maters $500 to $800 annually in unrestricted aid.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

US RUBBER GRINDING WHEELS

"U.S." Grinding Wheels installed on Naxos-Union roll grinder.

"We're standardizing on 'U.S.' GRINDING WHEELS"

—Mr. Alex Munroe, Revere Copper & Brass, Inc.

After Alex Munroe of Revere's Baltimore plant installed "U.S." Grinding Wheels on their Naxos-Union roll grinders (for reconditioning rolls on their Sendzimir 51" rolling mill) several things were immediately apparent. Chatter was eliminated and stock removal was clean and efficient. Grinding time was cut approximately 30% while producing a regular finish.

That's why Revere is standardizing on "U.S." Grinding Wheels, not only on roll grinders but for reconditioning large back-up rolls. In fact, wherever "U.S." Wheels are used, performance reports have been excellent.

If you, as a manufacturer, want to reduce grinding wheel costs and increase production, "U.S." has what it takes. For "U.S." Wheels consistently outperform and reduce costs in case after case. Get in touch with your "U.S." Representative today or write or call the address below.

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Auto Steel Gets Tight: GM Hurt Worst

Despite rumors of shutdowns, most of the industry still can build through October. GM may have to close down some assembly lines by midmonth. Partmaking plants are slowing down now

AUTOMAKERS' cupboards are bare. Even if steelworkers go back to their jobs immediately, General Motors Corp. will face at least a week of shutdown before mills can roll enough steel to continue 1960 model buildups. To avert such a calamity, the firm is stockpiling ingots so reopened mills will be able to start rolling steel at once. (It may be several weeks before they can tap their own furnaces.)

GM is hardest hit. It is collecting steel wherever it can. It has already confirmed a deal with Phoenix Steel Corp. for ingots (to be converted in Valley mills that still are operating). At least three sources say GM has another operation cooking with the just reopened Ohio River Steel Co. Informants claim GM will sign a three month contract for 70,000 ingot tons. Reported price is $108 per ton, delivered.

GM says it is seeking steel from any mills that are not strikebound. Shortages stem from going into the strike with 60 to 75 days of flat rolled products instead of the 90 days other carbuilders were shooting for.

• **Rundown** — About 7000 GM workers are laid off due to lack of steel. Central Foundry's Danville, Ill., plant and Ternstedt Div.'s Columbus, Ohio, facility were among the first to curtail operations. AC Spark Plug Div. can't get tin plate for its air cleaner manufacturing. It's substituting electroplated zinc galvanized sheets for the job but has already laid off 90 men.

Another 300 are on a four day week, and AC expects cutbacks affecting up to 3000 workers this week. Hyatt Bearings, New Departure, Harrison Radiator, and Delco Appliance plants are also cutting back. Detroit Transmission Div. is in reasonably good shape. It lacks alloy bars and some specialty steels, but the division has built up inventories of finished parts which will outlast assembly needs.

Edward Cole, Chevrolet's general manager, reports that several part plants and at least one assembly line are closed. With the exception of Corvair (buildups continue

REPLACING Dodge's Coronet, Dart comes in three series, Seneca, Pioneer, and Phoenix. Sedans, hardtops, and convertibles are built on Plymouth's 118 in. wheelbase and are 208.6 in. long. Station wagons are built on the Dodge 122 in. wheelbase. Length is 214.8 in. The cars are 55 in. high.

Chrysler's overhead valve, slant six, economy engine with 225 cu in. displacement, will be standard for Darts. It turns out 145 hp at 4000 rpm. Torque is 215 ft-lb at 2800 rpm. Compression ratio is 8.5:1. Bore and stroke are 3.40 x 4.125 in. The slant six has aluminum intake manifold tubes. Red Ram V-8s with two and four barrel carburetors are optional. So is the 310 hp D-500 with ram induction. All but the D-500 use regular fuel.

Although Dart is billed as an economy car (Senecas are expected to list below the old Coronet price of $2586), it looks like the top series with a full accessory pack will be nudging the $3000 mark. In keeping with the Space Age, Dodge's Royal and Custom Royal models have been renamed Matador and Polara.

through October), Chevy's other assembly lines will be down in two weeks.

By that time, Chevrolet expects to have built 142,000 full size cars, 57,000 Corvairs, and 55,000 trucks. All told, GM is planning on 475,000 car and truck completions before it runs out of steel. Oldsmobile, Pontiac, Buick, and Cadillac lines will be forced to close out during the latter half of October.

Pontiac may substitute aluminum for steel in its bumpers. The division hadn't planned on making this switch before 1961, but steel shortages may force it into the substitution.

The Pontiac Div. won't confirm this rumor, but it doesn't deny it either, saying only that it isn't doing so now.

• **Competitors**—Chrysler and Ford are in better shape than GM. Chrysler's setup with Lone Star Steel gives it enough tonnage so the corporation claims it can build into the latter half of November before closing any of its lines.

Ford's own mill is proving its worth now. Even so, the company will be able to run only through mid-November before shortages of specialty and alloy steels will shut down its assembly lines. The company has reopened its 14 in. bar mill but probably won't reactivate its other bar mill. If the strike continues, this additional 30 days of production can give Ford Div. a big break in the race with Chevrolet for 1959 calendar year sales. Chevrolet is some 35,000 sales ahead of Ford right now, but the Dearborn, Mich., automaker can build and sell double that number of cars by the end of the year.

Even if Ford assembly plants go down, the company still can run its steel mill and sell ingots to other mills, or stockpile them so it can get an early startup on poststrike production.

• **Little Two**—As reported earlier, AMC and S-P are in the best shape of all.

Both of them can build through November—possibly a bit beyond—without serious problems. But looking ahead to first quarter commitments, it's understood the Little Two are finding steel order books fuller than expected. Regardless of when the mills go back to work, both firms may find it tough to get enough steel for their first quarter production needs.

More Aluminum in 1960

David Reynolds, executive vice president, Reynolds Metals Co., Richmond, Va., predicts that the average 1960 car will use 60 lb of aluminum vs. 52 lb on this year's models. He figures per car usage should spurt to 100 lb by 1962.

In addition to Corvair's "mostly aluminum" engine, you will see aluminum heads on special Corvette models and aluminum intake manifold tubes on Chrysler's economy six engine next year.

Another producer has switched from copper to aluminum coils for horns.

Looking to 1961, Ford plans a running change to an aluminum manifold on its 1960, six cylinder powerplant. The company is supposed to use aluminum manifolds and rocker arms on all engines in '61. It looks like aluminum bumpers will be a reality next year. Reynolds has been pushing the extruded approach. Pontiac is interested. It may even make some short production runs this year. American Motors Corp. reportedly has signed a contract for the development of an aluminum engine with Doehler Jarvis Div., National Lead Co., Toledo, Ohio. It probably will be a diecast block with iron impregnated bores using the technique recently patented by A. F. Bauer, D-H's engineering vice president (see STEEL, Jan. 5, p. 119).

If 6.5 million cars are produced in 1960, the automotive industry should use 310 million lb of aluminum diecastings. The American Die Casting Institute predicts metalworking industries will produce 390 million lb of aluminum diecastings this year vs. 290.2 million lb in 1958.

Aluminum diecasting output in 1960 should be upwards of 480 million lb.

In anticipation, Alcoa announces it will add 200,000 sq ft to its diecasting facilities in Edison Township, N. J.

The plant, postponed since 1957, will produce carburetor and transmission parts and housings for the automotive trade.

U. S. Auto Output

Passenger Only	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	238,773	180,447
8 Mo. Totals	4,078,153	2,743,812
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
Aug. 29	18,335	16,771
Sept. 5	17,261	12,314
Sept. 12	24,364	24,072
Sept. 19	62,716	37,150
Sept. 26	88,906†	42,599
Oct. 3	115,000*	34,464

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Ford Marketing Man Says GNP to Top $500 Million

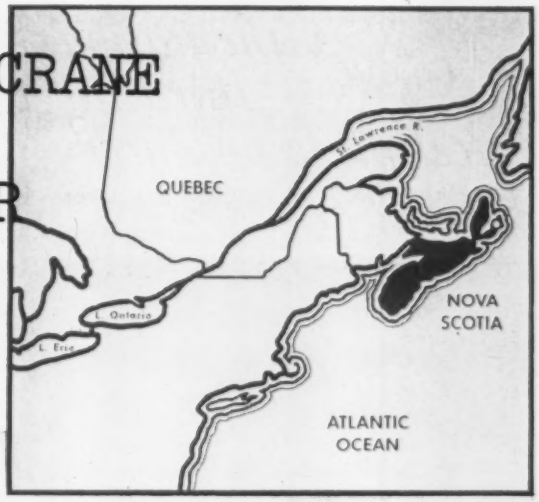
Car sales burgeoning toward the 7 million mark for 1960 make Robert Eggert, Ford's market research manager, believe gross national product will climb over the $500 billion rate early next year. Mr. Eggert adds that he expects a 65 per cent increase in the national economy by 1975.

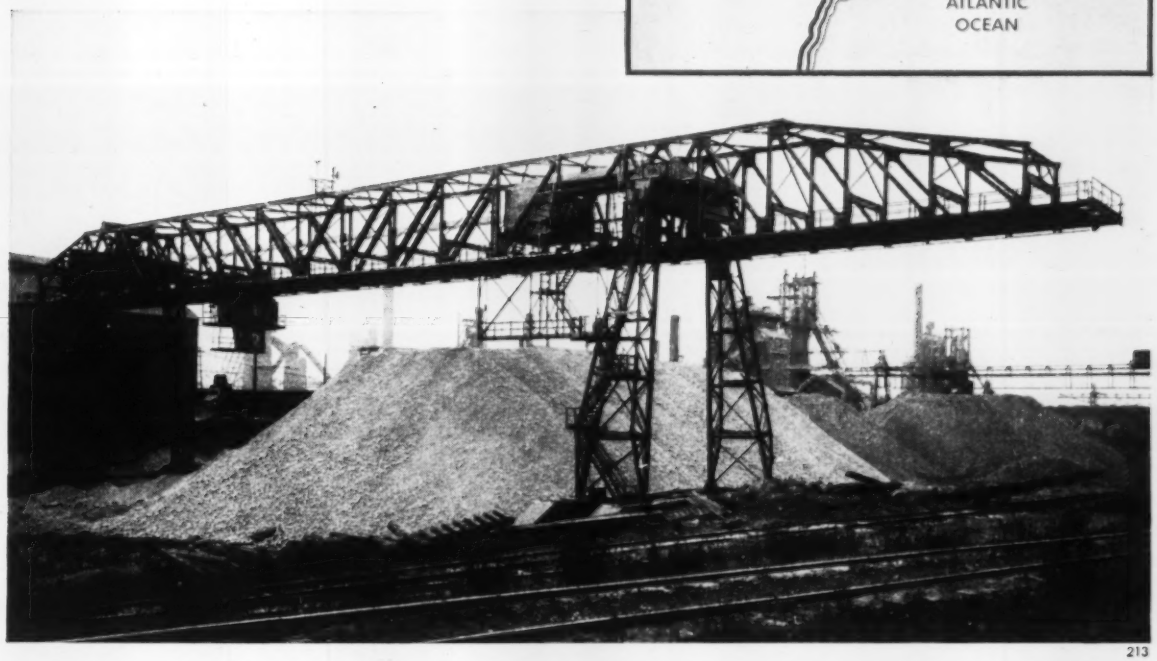
That calls for an average expansion rate of 3.3 per cent annually and means GNP will reach $825 billion within 15 years.

Ford Will Build a Second Economy Car—the Comet

Ford Motor Co. has decided to produce a second economy car, the Comet. It'll go on display next spring. Termed "the aristocrat of economy cars" by Henry Ford II, president, the auto will be marketed by Mercury dealers. Apparently, it's being designed for the class of car buyers who like elegance and luxury, but want a small car with good gas mileage. Mr. Ford says the Comet will have "family size roominess."

BROWNHOIST BRIDGE CRANE MOVES 700 TONS of material EVERY HOUR for Large Canadian Steel Mill





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This fast-operating storage and rehandling bridge is one of 3 Brownhoist bridge cranes used in the Blast Furnace Department of one of the largest steel mills in Canada. Controlled from a man-riding trolley, the crane, equipped with an 8 ton ore bucket, requires only 40 seconds per trip to haul 700 tons of iron ore, limestone or coke per hour!

Bridge span is 225 feet and 364 feet overall. Cantilevers are 86 and 53 feet, while the crane measures 63 feet from foundation rail to trolley rail.

Relied upon for high-speed, high-capacity materials handling, Industrial Brownhoist bridges and boat unloading equipment are found in mines, quarries, docks and steel mills throughout the world. Brownhoist also manufactures Diesel-Electric locomotive cranes from 25 to 90 tons and railroad cranes with capacities up to 250 tons.

Write for general catalog No. 562; it contains complete information on profitable Industrial Brownhoist equipment.

BROWNHOIST

CLAMSHELL BUCKET

250 TON WRECKING CRANE

COAL-ORE BRIDGE

CAR DUMPER

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INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: Birmingham, Cleveland, Philadelphia, Chicago, San Francisco, Montreal.

Now the nation's third largest steel plate producer

Left to right: George Copeland, Manager of Lukens' newly consolidated Sales Service Division, with department heads Arthur Powers of Customer Service, and Richard Slider of Order Processing.

LUKENS STREAMLINES ITS CUSTOMER SERVICES

The demanding process of making quality steel plate can't be rushed. But Lukens *has* cut the time it takes to process your orders and answer service inquiries.

In our *Customer Service Dept.*, for example, quotations, order status information, and similar requests are now handled by five area supervisors, each with a specific geographic territory to serve. All five are located in Coatesville. They and their staff members are ready to supply detailed information on any and all Lukens products —*promptly* through our sales offices.

Result: shortened lines of communication . . . faster action . . . greater customer satisfaction.

Equally important, our *Order Processing Dept.* has also been re-shaped. This one department now handles all orders for Lukens' full range of plate and fabricated products.

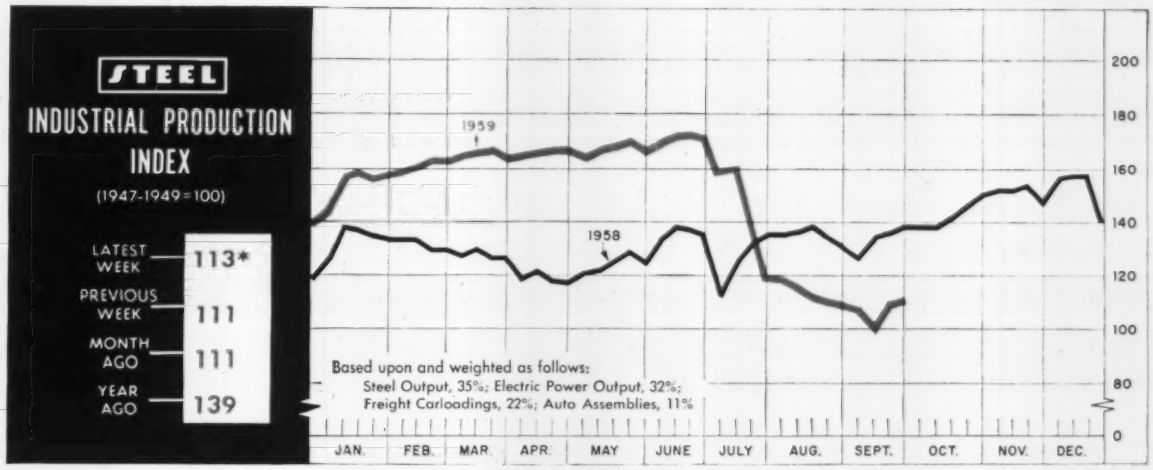
Streamlining our entire service organization was a logical complement to Lukens' "Phase A" expansion objectives: *new capacity and quality levels to meet the growing needs of our plate fabricating customers.*

Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

LUKENS ®

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE



*Week ended Sept. 26.

Strike Cuts Fourth Quarter Goals

THE HALF TRILLION dollar economy is out as far as 1959 is concerned, but the fourth quarter still shapes up as the best of the year. And a gross national product at an annual rate of $500 billion has only been postponed until the first quarter of 1960.

Few business analysts will dispute the claim that the strike has not slowed down the general economy up to now. The National Industrial Conference Board feels the walkout has "masked a further advance in the basic level of output in manufacturing."

The board adds: If the strike had been settled by mid-September, there would be no argument that GNP would be practically at the $500 billion mark by the end of the year.

• **Re-evaluation**—The time to take a new look at fourth quarter goals is at hand. If steel begins to flow from the furnaces this week, there are some who feel that we can still bump that magic half trillion mark. They reason that users, once assured of new supplies in the reasonably near future, will go ahead full steam with what they have. There has never been any question of capacity to produce or demand for end products. It has been simply a matter of adequate raw materials.

But others feel the damage has been done. Too many users are out of metal or dangerously close to it and cannot last until the mills get the pipelines flowing again. Even then, there is no assurance that everybody will be able to satisfy their needs. The consensus is that you will see one of the greatest scrambles for mill products that this country has ever seen. Reason: Unless there is an outright settlement, nobody is assured that there won't be another stoppage later this year.

• **Devaluation**—As a result, many business analysts have dropped 1959's GNP to between $490 billion and $495 billion, often with the remark: "After all, we're only dealing

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	368[1]	362	1,901
Electric Power Distributed (million kw-hr)	12,900[1]	12,779	12,342
Bituminous Coal Output (1,000 tons)	7,785[1]	6,375	8,533
Crude Oil Production (daily avg—1,000 bbl)	6,820[1]	6,823	7,100
Construction Volume (*ENR*—millions)	$410.7	$298.5	$370.7
Auto, Truck Output, U. S., Canada (*Ward's*)	115,806[1]	86,195	61,253
TRADE			
Freight Carloadings (1,000 Cars)	570[1]	578	673
Business Failures (Dun & Bradstreet)	264	222	262
Currency in Circulation (millions)[3]	$31,984	$32,197	$31,285
Dept. Store Sales (changes from year ago)[3]	+16%	−9%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26,426	$26,183	$23,515
Federal Gross Debt (billions)	$288.7	$290.0	$276.8
Bond Volume, NYSE (millions)	$44.6	$31.8	$31.5
Stocks Sales, NYSE (thousands of shares)	16,011	12,222	18,481
Loans and Investments (billions)[4]	$105.6	$105.0	$94.1
U. S. Govt. Obligations Held (billions)[4]	$28.9	$28.9	$31.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	246.65
STEEL's Nonferrous Metal Price Index[6]	225.2	225.3	199.0
All Commodities[7]	119.6	119.6	118.9
Commodities Other than Farm & Foods[7]	128.3	128.3	126.0

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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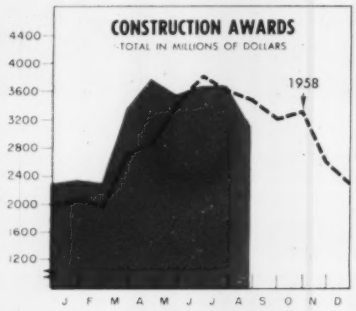
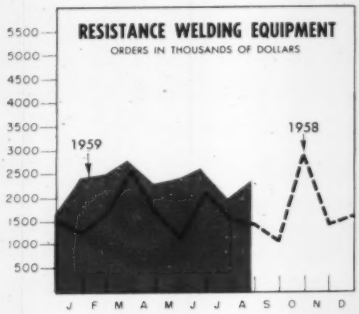
THE BUSINESS TREND





	Total		Building	
	1959	1958	1959	1958
Jan.	2,319.2	2,060.0	1,839.7	1,530.2
Feb.	2,307.0	1,953.4	1,777.4	1,478.1
Mar.	3,339.9	2,721.2	2,453.9	2,037.7
Apr.	3,778.4	2,881.0	3,018.0	2,198.0
May	3,541.9	3,402.6	2,748.8	2,470.3
June	3,659.0	3,819.6	2,816.9	2,340.3
July	3,656.5	3,607.1	2,880.8	2,633.5
Aug.	3,083.6	3,466.6	2,512.3	2,529.5
Sept.	.....	3,215.9	.....	2,352.5
Oct.	.....	3,309.0	.....	2,549.8
Nov.	.....	2,593.9	.....	1,980.8
Dec.	.....	2,281.9	.....	1,728.6
Totals	.....	35,312.2	.....	25,829.3

F. W. Dodge Corp.
Charts copyright, 1959, STEEL.

	Net Orders		Shipment	
	1959	1958	1959	1958
Jan.	2,396	1,243	1,427	1,422
Feb.	2,457	1,683	1,889	1,615
Mar.	2,811	2,550	2,179	1,659
Apr.	2,258	1,684	2,193	1,963
May	2,407	1,121	2,019	1,750
June	2,597	2,113	2,702	2,346
July	1,980	1,534	2,269	2,342
Aug.	2,322	1,431	2,928	1,419
Sept.	....	1,060	....	1,125
Oct.	....	2,885	....	1,559
Nov.	....	1,409	....	1,102
Dec.	....	1,554	....	1,357
Totals ...	....	20,258	....	19,659

Resistance Welder Manufacturers' Assn.

with trifles—maybe 1 per cent." But their cautious approach to the situation is unmistakable.

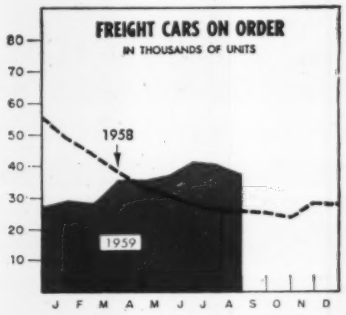
They may be influenced by business reports of the last few days. Sales of new autos continued to slump in the second ten-day period of September. *Ward's Automotive Reports* claims producers blame the listless market on the strike. And the American Institute of Steel Construction Inc. declares this is a major cause of the sharp drop in both orders and shipments of fabricated structural steel. Bookings dropped to 196,985 tons (lowest since last December), and shipments dipped to 220,420 tons (lowest since February).

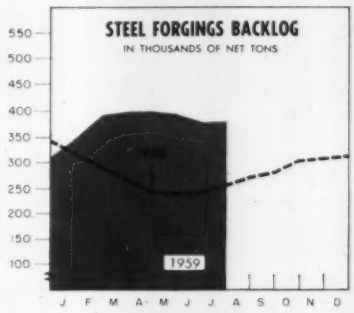
• **Revised Timetable**—But if we miss the half trillion dollar goal this year, it is bound to usher in the soaring '60s. William Carlin, economist for Republic Steel Corp., likens the strike to a small recession. "It lays the groundwork for an upturn once it is over." The industry had figured the last half to be a period of inventory liquidation. With little if any incentive to build again next year, there would be at least inventory stability.

The strike has lasted so long it will be well into 1960 before users can rebuild stocks to normal levels. With demand healthy through most of the year, this could result in the biggest steel output on record—perhaps in the 120 million ton range.

• **Prolongs Boom** — While many economists have been reluctant to go beyond the third quarter of 1960 with their predictions, there is a growing sentiment for extending the uptrend into next year's fourth quarter. They feel that the strike may have delayed the whole business cycle by two to three months. They admit that the curve may flatten out by late next year, but they don't see it heading down until 1961.

Others, however, say this would be too great an extension of the cycle. They feel that auto production in late 1960 will not measure up to plans for this quarter and that housing will be significantly lower than the current annual rate of over 1.3 million starts. Some consumer goods, such as appliances, and industrial construction may tend to offset those declines, but the over-all effect will be a softening of the economy preparatory to a mild recession.





	Awards		Backlogs (end of month)	
	1959	1958	1959	1958
Jan.	4,007	401	29,470	48,787
Feb.	1,806	287	28,789	43,750
Mar.	10,795	193	35,487	38,027
Apr.	3,736	278	35,479	32,908
May	5,253	1,372	36,869	30,386
June	8,054	317	40,973	27,757
July	4,159	376	40,309	25,994
Aug.	1,753	1,773	37,172	25,611
Sept.	....	1,580	.....	24,982
Oct.	....	781	.....	23,670
Nov.	....	6,295	.....	27,962
Dec.	....	3,830	.....	27,596
Total	....	17,481		

American Railway Car Institute.

	Shipments		Unfilled Orders	
	1959	1958	1959	1958
Jan.	113	108	353	318
Feb.	113	93	392	289
Mar.	129	92	396	266
Apr.	136	83	398	242
May	142	78	394	240
June	140	88	375	246
July	103	67	377	256
Aug.	....	80	...	279
Sept.	....	89	...	287
Oct.	....	100	...	303
Nov.	....	89	...	307
Dec.	....	113	...	313

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

• **Total Agreement**—About the only thing on which they are in complete accord is that no matter what happens in the steel strike, once it is permanently settled, the economy is going to be in good shape.

Building Pattern Changes

The "product mix" in the construction industry has been undergoing a change all year, and now, for the first time since the industrial building boom of 1956, private work outweighs public, says *Engineering News-Record*. Led by the upsurge in industrial building, private awards for the first 39 weeks of 1959 totaled $7.934 billion, moving ahead of the $7.929 billion of public awards. While all private award categories are running well ahead of the corresponding 1958 figures, industrial building shows a whopping 66 per cent bulge.

But Dr. George Cline Smith, vice president and economist of F. W. Dodge Corp., reports that contracts as a whole have slowed down a little because of the steel strike. Awards in August declined 11 per cent below the corresponding figure for August, 1958, but still ranked as the second best in history for that month (see graph and table, Page 68).

"There is no evidence that any great slowing of actual construction occurred in August as the result of steel shortage," he comments. "But the awarding of contracts for future jobs may well have been held up because of uncertainties over steel deliveries and prices. . . The August decline should not be viewed too seriously since it is largely a matter of timing, and could to a considerable extent be made up later. But the strike is now beginning to pinch, and if it is continued many more weeks, it will become progressively harder to make up the time lost."

Trends Fore and Aft

• The bookings index of the American Gear Manufacturers Association dropped 18.8 per cent to 213.3 (1947-49 = 100) in August, the lowest point since February.

• Both orders and shipments of resistance welding equipment advanced significantly in August (see graph and table, Page 68).

• Large producers of rail equipment have laid off about 3500 workers because of steel shortages, an industrywide survey shows.

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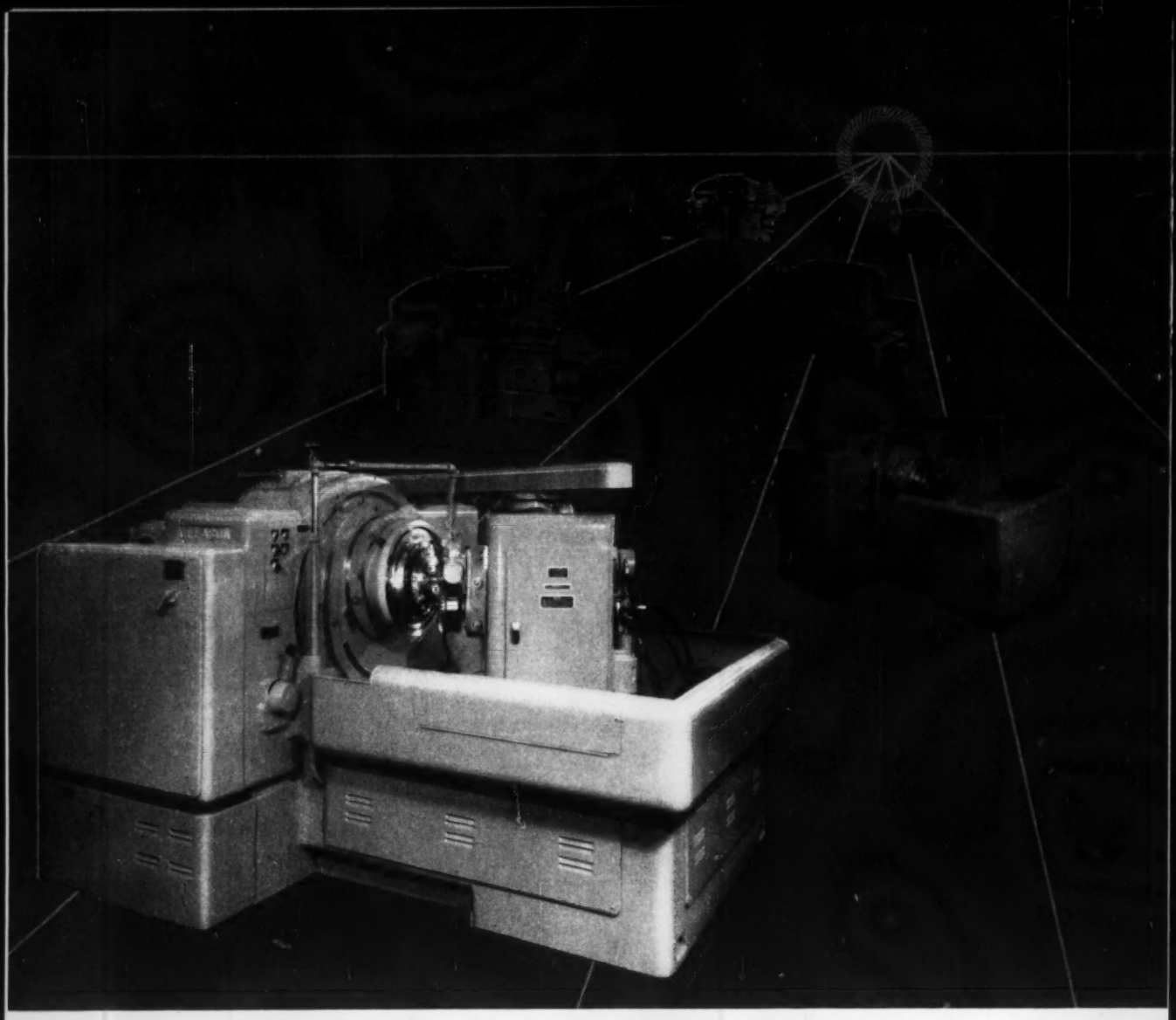

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1. Single-Cycle® Method. Using this method, you can cut nongenerated gears four to five times faster than previously possible on machines of this type. Cradle and work head are locked in position. The last rotation of the Single-Cycle Cutter finishes both sides of a tooth space. You cut the mating pinions on the same machine, using the conventional single-roll generating method.

2. Cyclex® Method. For certain applications you can use the extremely fast Cyclex Method on the No. 108 Generator. You cut nongenerated gears in one completing operation from the solid blank.

3. Generated Gears and Pinions. You can produce both gears and pinions on this machine with the generating method. Here, a relative rolling motion takes place between gear or pinion and the rotating cutter. Once the gear is chucked in the work head, the machine operation is entirely automatic.

4. Unitool* Method. If you want to cut small quantities of spiral bevel, Zerol® bevel, or hypoid gears with a minimum of tooling, you can use the Unitool Method. You cut both gears and pinions with a single cutter. This method is particularly useful for experimental gears for prototype work.

*Trademark

The No. 118 Hypoid Generator handles gears up to 18″ diameter at a 10:1 ratio, to a *maximum* coarseness of 2 DP. For production of smaller gears, the No. 108 Generator cuts gears up to 8½″ diameter at a 10:1 ratio and to 4 DP. A third model, the No. 28 Hypoid Generator, cuts gears up to 33″ diameter at a 10:1 ratio, 1½ DP.

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DONALD E. CUMMINGS
Air Products div. mgr.

ALTON L. WHEELER
Peninsular Steel sales mgr.

FRANK S. WILSON
heads Gabriel overseas div.

RAY R. WEST
heads Honeywell div.

Donald E. Cummings was appointed general manager of **Air Products Inc.'s** new Industrial Gas Div., Allentown, Pa., formed to co-ordinate marketing of gases to steel mills and general industrial consumers. **H. E. Everett** was named assistant general manager of the division. **John K. Stewart** was made general sales manager.

Alton L. Wheeler was appointed manager-sales, **Peninsular Steel Co.**, Detroit, to succeed **Wesley A. Kurtz**, now vice president-customer relations. Mr. Wheeler will direct sales activities of all nine steel service centers of the company.

James F. Ellison was made purchasing agent, **Brown-Wales Co.**, Cambridge, Mass. For the last 19 years, he has been at General Electric Co. in Lynn, Mass., as buyer of steel and raw materials.

M. M. Anderson was appointed vice president - engineering, **Stran - Steel Corp.**, at Terre Haute, Ind.

George M. Brydon was elected a vice president, **Union Twist Drill Co.**, Athol, Mass. He continues as general manager, Butterfield Div.

James A. Erdle joined **Servo Corp. of America**, Hicksville, N. Y., as facilities planning engineer. He was chief engineer at Johnson & Hoffman Mfg. Corp.

Hill-Chase Steel Co. of Maryland, Baltimore, promoted **F. William Jacober Jr.** to manager of product sales; **A. Raymond Coats Jr.** to assistant manager-product sales.

Frank S. Wilson was made general manager of **Gabriel Co.'s** newly formed International Div., Cleveland. He was formerly director, Investment Development Div., Bureau of Foreign Commerce, Department of Commerce, Washington.

Roland H. Wilson was made assistant works manager, **Riverside Metal Works**, Riverside-Alloy Metal Div., Riverside, N. J., H. K. Porter Company Inc. He was co-ordinator for modernization programs at Riverside.

Harold M. Krueger was appointed general manager, **Christensen & Olsen Foundry Co.**, Chicago. He is assisted by **Marvin M. Oswalt**. Both were formerly associated with National Bearing Div., American Brake Shoe Co. Mr. Krueger will be in charge of plant operation, sales, personnel, and expansion. Mr. Oswalt will supervise production and quality control.

Robert W. Hubner was made executive assistant to the president of **International Business Machines Corp.**, New York. He was regional manager-marketing services, Data Processing Div. Mr. Hubner succeeds **Walter H. Johnson**, named director of product planning on the corporate staff.

David D. Hunsaker was made manager-sales development, **Frank G. Hough Co.**, Libertyville, Ill.

Robert A. Lombard was made sales manager, Langevin Div., **W. L. Maxson Corp.**, New York.

Ray R. West was named manager, Industrial Controls Div., a consolidation of the control devices and machine controls departments of **Minneapolis-Honeywell Regulator Co.**, Minneapolis. Mr. West formerly headed the control devices section, and transfers from the firm's Brown Instruments Div. in Philadelphia to Honeywell's home office in Minneapolis.

E. W. Shuster was made co-ordinator of foreign business for **E. W. Bliss Co.** He will be in Canton, Ohio. He served as European representative for the last four years. **H. A. Lampmann** was made manager of European sales engineering for the company's Rolling Mill and Mackintosh-Hemphill Divisions. He has headquarters at the Bliss plant near Paris.

Ralph C. Read was elected executive vice president, **Cenco Instruments Corp.**, Chicago. He also was elected executive vice president of Central Scientific Co., subsidiary, of which he was formerly a vice president.

Ernest A. Sticha was named chief research metallurgist by **Edward Valves Inc.**, East Chicago, Ind., subsidiary of Rockwell Mfg. Co. He was supervising engineer for Crane Co.

Carl B. Johnson, general manager, Armour Alliance Industries, was named a vice president of **Armour & Co.**, Chicago. He continues in charge of the Alliance operation.

Bruce M. Smith was made chief industrial engineer for **SKF Industries Inc.**, Philadelphia. He suc-

LESLIE M. HESS

E. C. HANNA

Landis Machine staff changes

RALPH W. BARKER

ROBERT K. KELLY

general foundry supts.-Superior Foundry

ceeds **Stuart J. Northrop,** now mechanical superintendent.

Leslie M. Hess was elected vice president and assistant general manager, **Landis Machine Co.,** Waynesboro, Pa. **E. C. Hanna** fills the new post of director of engineering and is succeeded as chief research engineer by **George W. Lyman.** Mr. Hess was treasurer and assistant controller. **H. L. Steck,** former controller, is now controller-treasurer.

Robert L. Kerwin was appointed metallurgical engineer by **Earle M. Jorgensen Co.** to serve the Tulsa, Okla., Wichita, Kans., and Denver plants.

P. B. Case was made assistant manager of the Marietta, Ohio, Works of **Union Carbide Metals Co.,** a division of Union Carbide Corp. Mr. Case was superintendent-major alloys at the Ashtabula, Ohio, plant. He succeeds **George H. Griffin** who, in preparation for retirement, will be on special assignments and will serve in a consulting capacity.

Ralph W. Barker was made general foundry superintendent, Superior Foundry Div., **Superior Foundry Inc.,** Cleveland. **Robert K. Kelly** was made general foundry superintendent, Allyne-Ryan Div. Mr. Barker was melting superintendent of the Ford Cleveland Foundry, Ford Motor Co. Mr. Kelly was assistant to the plant manager, Allyne-Ryan Div.

Dr. J. Robert Spraul was made acting manager, Research & Development Dept., **Rheem Mfg. Co.** He has headquarters at the South Gate, Calif., plant.

Cecil W. Guyatt was made chief industrial engineer, **Reynolds Metals Co.,** Richmond, Va. He was chief industrial engineer in charge of methods at United States Steel Corp.

A. S. Rairden was made works manager, Palmer, Mass., plant, **Colorado Fuel & Iron Corp.** He was general wire rope sales manager for CF&I. Mr. Rairden succeeds **Frederick G. Lindstrom** who retires Oct. 31. **Alfred Ziegler** was appointed general superintendent of the Palmer plant.

Anton Dorfmueller Jr. was made assistant general manager; **Robert J. Mulligan** general sales manager, Federal Foundry Supply Div., **Archer-Daniels-Midland Co.,** Cleveland. Mr. Mulligan, formerly in charge of foundry products research and development, succeeds Mr. Dorfmueller.

Sidney Wade was appointed vice president-distributor products, **Linde Co.,** a division of Union Carbide Corp., New York.

Russell A. Hedden was appointed works manager-manufacturing, Industries Group, at **Allis-Chalmers Mfg. Co.'s** West Allis, Wis., Works. He succeeds **E. W. Bonness,** named consultant to the director of manufacturing, Industries Group. Mr. Hedden was works manager, York, Pa., Works.

Frederick Burns joined **Hughes Aircraft Co.'s** Manufacturing Div., El

P. B. CASE

Union Carbide Metals post

CECIL W. GUYATT

Reynolds Metals eng.

A. S. RAIRDEN

CF&I works manager

RUSSELL A. HEDDEN

Allis-Chalmers works mgr.

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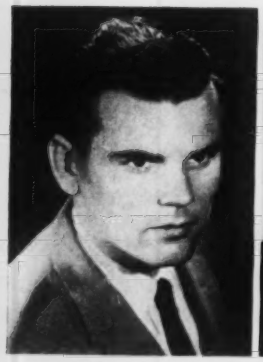


RAY V. LONG
Vapor Recovery exec. v. p.

HARRY D. STONE
Kelsey-Hayes sales post

E. M. RAMBERG
Titeflex marketing v. p.

FRANK W. CHAMBERS
Strategic Materials exec.

LAURENCE C. JACOBSEN
Vulcan Rail president

ROBERT S. BOLLIN
Toledo Pipe Threading post

Segundo, Calif., as assistant manager-quality control.

Frank W. Chambers was appointed executive vice president, **Strategic Materials Corp.**, Buffalo. He was director of engineering of Kennecott Copper Corp.

David Ferguson was appointed assistant to vice president-Chicago, **United States Steel Corp.** He was assistant district director, Chicago public relations district.

Hartley B. Brown was appointed vice president-sales, **Alabama Metal Lath Co. Inc.**, Birmingham. He succeeds **Charles B. Webb Jr.**, resigned. He was merchandise manager-steel products, United States Gypsum Co.

Clifford L. Johnson was promoted to manufacturing manager, **Hyatt Bearings Div.**, Harrison, N. J., General Motors Corp. He is succeeded by **James L. Elliott** as director of production engineering at AC Spark Plug Div. in Flint, Mich.

Laurence C. Jacobsen was elected president and chief executive officer, **Vulcan Rail & Construction Co.**, New York. He succeeds **J. Arthur Netzel** who continues in his present capacity as chairman. Mr. Jacobsen has been vice president since 1958.

Robert S. Bollin was appointed chief engineer, **Toledo Pipe Threading Machine Co.**, Toledo, Ohio. He joined the firm early this year as assistant chief engineer. He previously served with E. W. Bliss Co. in Toledo for more than ten years, progressing from junior engineer to senior engineer and group leader.

Gordon Banerian, manager, Turbo-Machinery Div., Aerojet-General Corp., Azusa, Calif., was appointed vice president-engineering of its subsidiary, **Aerojet-General Nucleonics**, at San Ramon, Calif.

Dr. Carol Calosi fills the new post of vice president-Europe for **Raytheon Co.** He will have headquarters in Rome.

Ray V. Long was named executive vice president, **Vapor Recovery Systems Co.**, Compton, Calif. He was vice president and sales manager. **Arnold A. Wilcox** was appointed vice president-manufacturing. **H. Dickinson** was made vice president-engineering.

Harry D. Stone was named manager, sales and marketing, at the Metals Div., New Hartford, N. Y., **Kelsey-Hayes Co.** He was sales manager, NRC Equipment Corp.

E. M. Ramberg was appointed vice president-marketing for **Titeflex Inc.**, Springfield, Mass., subsidiary of Atlas Corp. Mr. Ramberg served as vice president-engineering for the last three years.

James H. Goss was appointed vice president and group executive of the new International Group, **General Electric Co.**, New York. He is succeeded as vice president-group executive, Consumer Products Group by **Fred J. Borch. Charles K. Rieger** succeeds Mr. Borch as vice president-marketing services, and is replaced as general manager, Major Appliance Div., Louisville, by **William P. Van Behren.**

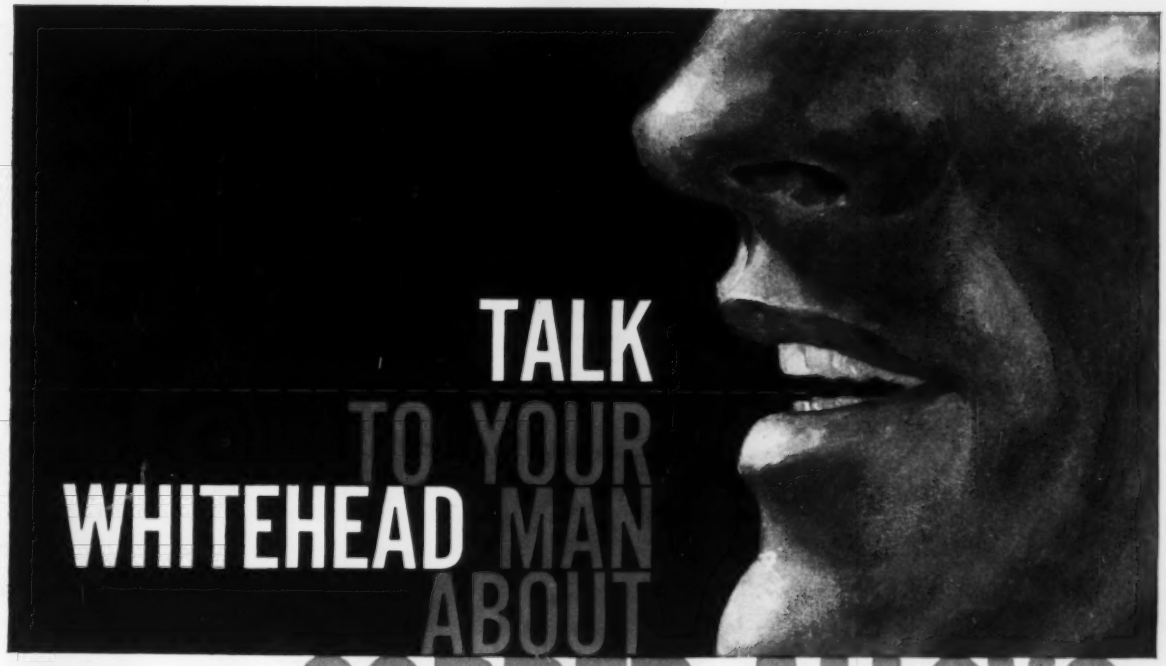
C. T. DuBreuil was named vice president and chief engineer for **Fyr-Fyter Co.**, Dayton, Ohio. He is in charge of the new Central Engineering Dept. at the Newark, N. J., plant.

OBITUARIES...

Walter F. Munford, 59, president and chief administrative officer of **United States Steel Corp.**, Pittsburgh, died Sept. 28. He assumed the presidency of the corporation last May. Mr. Munford was president of American Steel & Wire Div., Cleveland, from 1953 to 1956. He then went to Pittsburgh as assistant executive vice president of the corporation, and two years later, in March, 1958, became executive vice president-engineering and research.

Edwin J. Appel, 65, manager of the Power and New Facilities Dept., **Reynolds Metals Co.**, Richmond, Va., died Sept. 23.

Meyer B. Mervis, 66, president, **Mercon Co.**, Chicago, and executive vice president of **Copperweld Steel Co.**, Pittsburgh, died Sept. 23.



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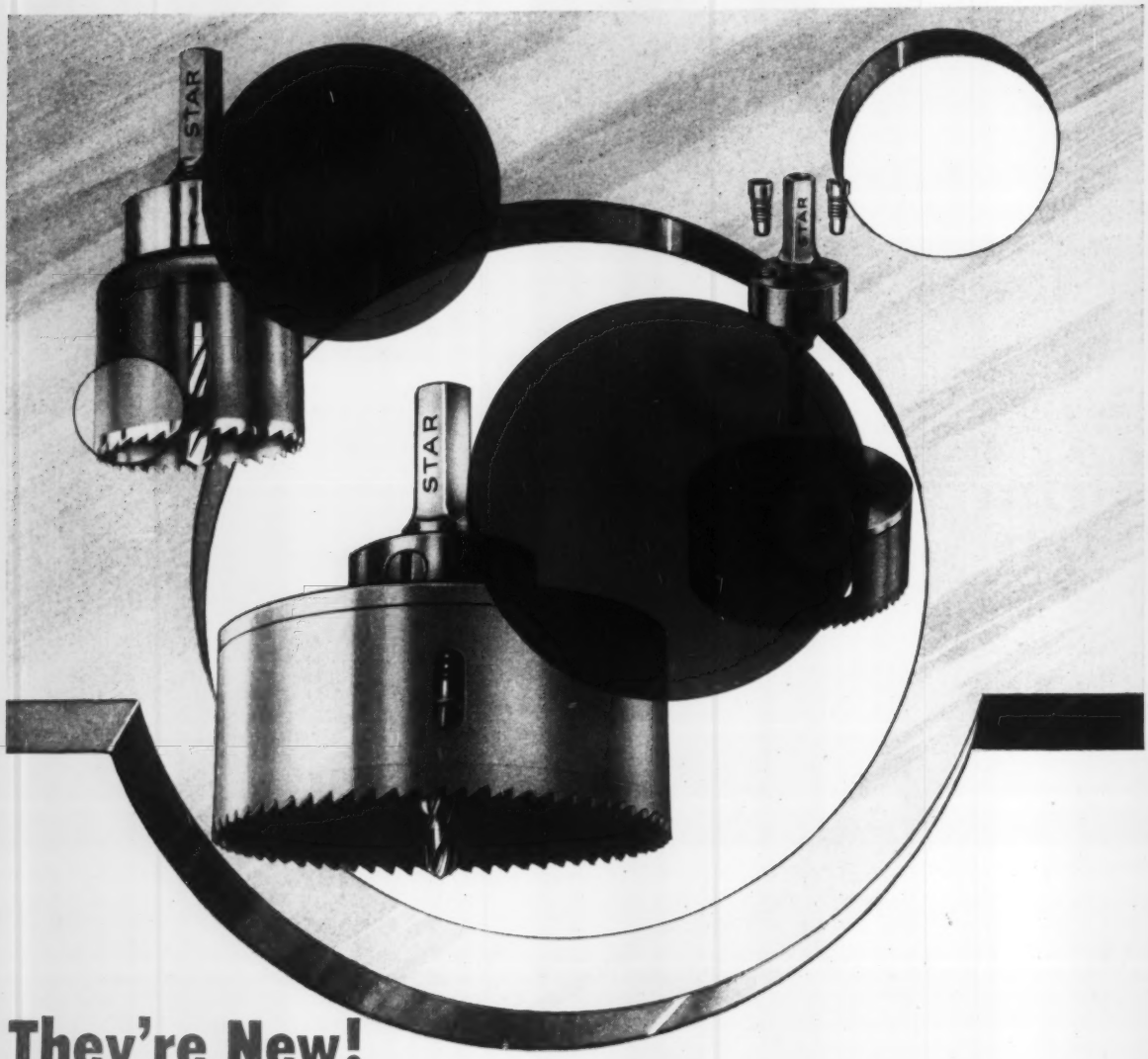

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. . . the fastest cutting, most durable hole saws ever—latest addition to the outstanding STAR line

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Completely safe, shatterproof line of hole saws. They feature extra-tough bodies—high speed steel cutting edges—cut clean round holes from 9/16" to 6" diameter, in metals, plastics, wood—up to 1-1/2" thick. New STAR Moly® High Speed Hole Saws—suited for use with portable power tools or machine tools such as lathes, drill presses, radial drills.

Because STAR Hole Saws are the fastest cutting, most durable hole saws you've ever tried, you can be sure that they'll deliver better performance—and profits—for you. If *you'd* like to hitch your wagon to fast cutting STAR, write soon. We'll send full details promptly.

2074

Write today for full details.

STAR HACK SAW and BAND BLADES

***Manufactured by* CLEMSON BROS., Inc.**

Middletown, N. Y., U. S. A.

Warehouses in Brooklyn • Chicago • Denver • Houston • Los Angeles • Newark • New York City • Portland, Ore.

Makers of Hand and Power Hack Saw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Lawn Machines

Europe's Business Forecast: Definite Improvement in '60

INDUSTRIAL GROWTH on the European continent, particularly in countries of the Common Market group, will be renewed next year, believes Hobart C. Ramsey, chairman of Worthington Corp., Harrison, N. J., who recently completed a fact finding trip in Europe.

"Right now, the activity in the European Common Market countries has leveled off, after its strong surge of the past three years," he says. "However, an upward movement is now apparent, and it will definitely improve the industrial climate there in 1960. Underlying the improvement will be the trend toward lower tariffs in Europe.

"Early ample supplies of oil from North African fields will provide the impetus for growth in new industries such as petrochemicals. Two pipelines, one opened this summer and the other scheduled for completion next year, will bring the North African oil to Mediterranean ports for shipment to Europe."

• **Good Year Here**—Domestically, says Mr. Ramsey, Worthington believes "1960 will be a good year. New orders are coming in in gratifying volume; backlogs are increasing; and there are many broad indications that in this country increased interest is being shown in capital expenditures.

"If we work our way out of union differences in a realistic way, American industry will do all right. But it will not be time to 'throw our hats in the air' until the labor picture is settled."

Revises Marketing Setup

Okonite Co., Passaic, N. J., and Chase Brass & Copper Co., Waterbury, Conn., have changed their setup for marketing wire and cable products made by Kennecott Wire & Cable Co., Phillipsdale, R. I., a division of Okonite. Responsibility for sales has been assumed by Okonite. In the past, most of the products affected were marketed through Chase. The new method of marketing is effective Nov. 1.

Chase which markets its own line of brass wire mill products, will continue to supply certain customers (makers of nails, cold headed products, roofing products, strainers, fasteners) with bare copper wire made by Kennecott Wire & Cable. Chase will continue to make and supply copper bus conductor in flat and tubular form for the electrical industry.

Sales headquarters of the Kennecott Wire & Cable Co. will remain at Phillipsdale under the direction of E. S. Rising, division vice president.

Forms International Div.

Gabriel Co., Cleveland, organized an International Div. with Frank S. Wilson as general manager to coordinate all overseas operations.

Broadens Heat Treating

Chance Vought Aircraft Inc., Dallas, is equipping its heat treating facility to handle such exotic metals as molybdenum, vanadium, tungsten, columbium, tantalum, and thorium. The $1 million modernization program will provide higher temperature capabilities (up to 3000° F). New equipment will include 15 heat treating furnaces which will be in operation by the end of 1960.

Porter Builds Plant

H. K. Porter Company Inc., Pittsburgh, has completed construction of its $12 million plant for production of magnesia from sea water and basic refractories at Pascagoula, Miss. The Pascagoula Works, using magnesia produced at the sea water plant, manufactures chrome-magnesite, magnesite chrome, and periclase type basic brick in burned, unburned, and steel-encased bodies. In addition, a line of chrome and periclase specialties is produced.

Ralph Rose is basic products supervisor; R. G. Vervaeke, works manager; and J. G. Bartel, general superintendent.

Extends Surface Grinding

Peninsular Steel Co., Detroit, has completed construction of a plant addition to be used exclusively for surface grinding. It will be able to surface grind areas up to 100 in. in diameter with the equipment installed.

J&L Enlarges Tube Plant

Jones & Laughlin Steel Corp., Pittsburgh, has tripled the capacity for producing tubing for boilers, heat exchangers, and condensers at its Electricweld Tube Div., Oil City, Pa. The division has completed the installation of a second controlled atmosphere roller hearth annealing furnace, improved equipment for nondestructive testing, and a large draw bench.

H. N. Scott, manager of sales-electricweld tube products, announces plans for construction of an additional 25,000 sq ft on the division's main building to provide more storage space, and for expansion of in-line production of pressure tubing.

Plans $8 Million Plant

First Mississippi Corp., Jackson, Miss., will decide shortly on one of three sites for an $8 million plant to make steel pipe and beams for heavy construction. It plans to start construction early next year.

Air Products Expanding

Air Products Inc., Allentown, Pa., has established an Industrial Gas Div. to co-ordinate the marketing of gases to steel mills and general industrial consumers. The division will distribute oxygen, nitrogen, argon, hydrogen, and acetylene by pipeline, trucktrailer, railroad tank car, and in cylinders. The company has built, or is building, major gas producing plants at Pittsburgh, Chicago, Cleveland, St. Louis, Detroit, Granite City, Ill., and Weirton, W. Va. The firm's current ex-

(*Please turn to Page* 80)

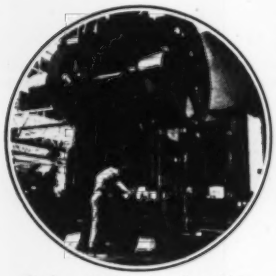
Tubexperience in action

What are your tubing requirements?

Do you know that tubing can be formed into many unusual shapes? That it can cut the costs of many parts formerly machined from bar stock? That you can get it in many standard analyses or special ones with unique physical and mechanical properties? That no matter what the shape, the physical characteristics, the mechanical properties, the type of application—Superior can supply your needs? Superior is the world's largest producer of small-diameter tubing. More than 120 analyses are offered, including many types of stainless, carbon and alloy steels, nickel and nickel alloys, beryllium copper, titanium, zirconium and super alloys.

Typical of the scope of Superior tubing are those listed on facing page—carbon hydraulic tubing, stainless and carbon mechanical tubing, leaded steel tubing with excellent machining and forming characteristics, pressure and super pressure tubing, tool steel tubing, and many other types to fit most requirements. For assistance in the selection and application of Superior tubing, write for the name of your nearest Steel Service Center stocking this product and a copy of Bulletin 41. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

{ • SPECIAL SHAPES • COSTS • UNUSUAL PHYSICAL CHARACTERISTICS • UNIQUE MECHANICAL PROPERTIES



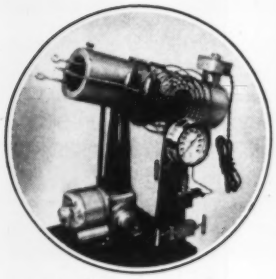
Carbon steel hydraulic tubing

FOR HYDRAULIC AND PNEUMATIC LINES:

Superior (SAE) Carbon Steel Hydraulic Tubing. Made from nonaging steel with high ductility properties in sizes from ⅛ in. through 1⅛ in. 100% hydrostatic pressure and flare tested. OD and ID surfaces are smooth, bright, uniform and protected with a special rust preventive. Recommended for pressures up to 3000 psi.

FOR HIGH PRESSURE APPLICATIONS:

Super Pressure Tubing. Single wall for pressures ranging from 15,000 to 30,000 psi. Available in ODs from .125 to .750 in. Made from Types 304, 316, 321 and 347 and in AISI Type 4130 alloy steel. Composite wall for pressures as high as 100,000 psi. Recommended combinations are low carbon steels and stainless steels, nickel base alloys and stainless steels.

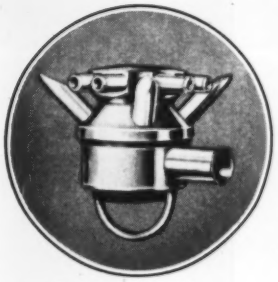


Super pressure tubing

FOR MANY MECHANICAL APPLICATIONS:

Seamless Carbon Steel Tubing. 11 standard and 3 special grades for an endless number of applications. Stocked by Steel Service Centers in a broad range of sizes with diverse mechanical and physical properties.

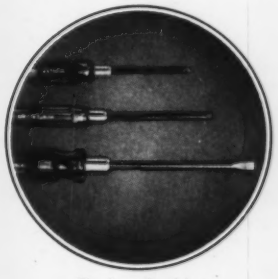
Seamless & WELDRAWN® Stainless Tubing. Type 303, for use where a free cutting material is required; offers high resistance to corrosion; assures good end-product surface. Also many other analyses.



Stainless steel tubing

Leaded Carbon Steel Tubing. Has built-in lubrication to permit faster speeds, heavier feeds. Will often reduce costs by requiring fewer finishing operations. Available in a range of ODs from .012 through 1⅛ in. in Leaded 1020.

Alloy Steel Tubing. In a number of different analyses. Designed for production of such parts as thread guides, races, gear and pinion parts, mandrels, etc.

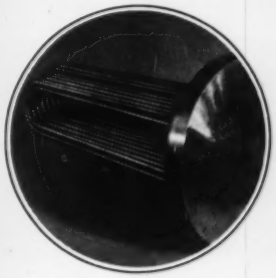


Tool steel tubing

Tool Steels. Produced from MT-1095 high-carbon steel and E-52100 alloy steel. Both grades have excellent strength, hardness and wear resistance. Both can be oil hardened to improve toughness and abrasion resistance. Available in sizes from .012 through ⅜ in. OD.

FOR HIGH TEMPERATURES REQUIRING HIGH STRENGTH, GOOD OXIDATION AND CORROSION RESISTANCE:

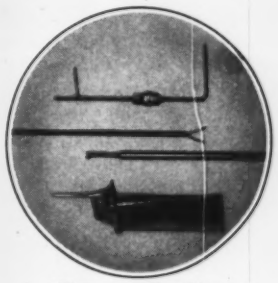
Super Alloy Tubing: Analyses include Types 316, A-286, 19-9DL, 16-25-6, Croloy 15-15N, Inconel X, Nichrome V, Hastelloy X, Hastelloy F, Waspalloy, Haynes 25 and N-155. Has a minimum stress rupture strength of 25,000 psi at 1000 hr. and 1200 F. Resists progressive scaling and other types of corrosion. Will not fail through brittle fracture or show excessive grain growth at operating temperature.



Heat exchanger tubing

FOR HEAT TRANSFER EQUIPMENT:

Heat Exchanger Tubing. Made from MT-1010, 502, 304, 304L, 316, 347, 348. Strict adherence to the highest commercial and military combined specifications. Quality controlled with uniform wall and extra close tolerances. Precise surface inspection. 100% flare and pressure tested. Excellent brazing and welding qualities.



Thermocouple tubing

FOR ELECTRICAL, ELECTRONIC AND SPECIAL APPLICATIONS REQUIRING GOOD CORROSION RESISTANCE:

Nickel Alloys: Analyses include Low Carbon Nickel, A Nickel, D Nickel, DURANickel, Monel, Inconel, Ni-Span C, Nionel, Nimonic, Hastelloy, Haynes 25, Permalloy, Chromel P, Alumel, Nichrome V and Invar. Many sizes, shapes and tempers. Excellent corrosion resistance, high strength and workability.

Superior Tube

The big name in small tubing

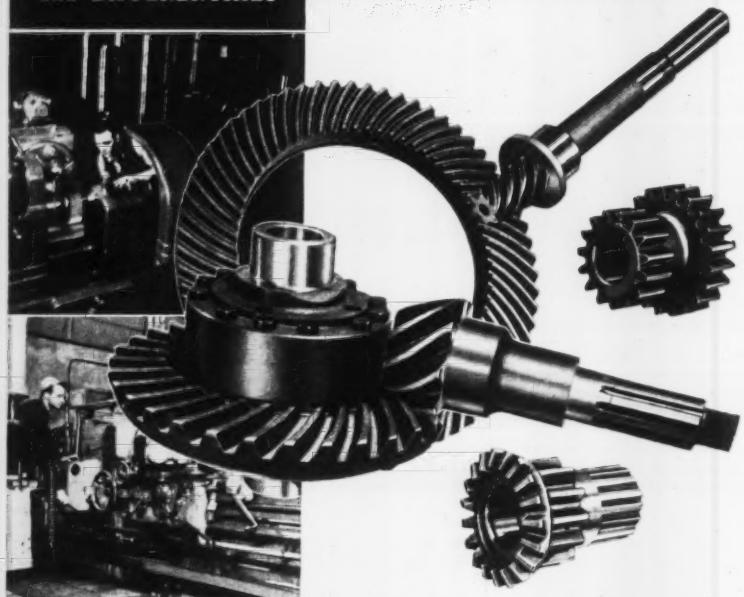
NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

GEARS
and DIFFERENTIALS

made to Your order by
FAIRFIELD

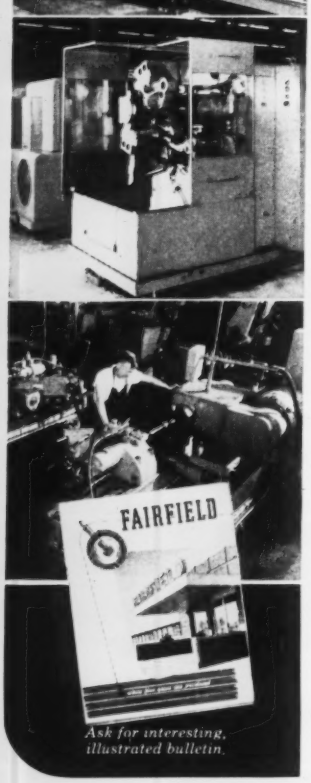


A Plus Value IN ANY PRODUCT!

Simple arithmetic explains why, TODAY, many of America's leading machine makers no longer undertake to solve the problems involved in production of gears, differentials, and specially designed gear parts. For them, FAIRFIELD IS THE ANSWER!

Every facility is available at Fairfield — latest, cost-cutting, ultra-modern metal-working and heat treating equipment, kept busy by volume production, *plus* expert engineering counsel. This makes for economy and efficiency that can benefit YOU.

Check with Fairfield NOW on your gear production schedules. As one of the nation's largest independent producers, Fairfield can usually give you quickest service available and handle any production requirement. *Become a Fairfield customer; it pays!* CALL OR WRITE.



Ask for interesting, illustrated bulletin.

FAIRFIELD MANUFACTURING CO.

2313 South Concord Rd. Lafayette, Indiana
TELEPHONE: SHerwood 2-7353

for FINE GEARS

Gears and Differentials Made to Order for:

TRACTORS • HEAVY DUTY TRUCKS • AGRICULTURAL MACHINERY • POWER SHOVELS AND CRANES
MINING MACHINES • ROAD GRADERS • BUSES • STREET SWEEPERS • INDUSTRIAL LIFT TRUCKS

(*Concluded from Page 77*)

pansion program involves $37 million. Officers of the division include: D. E. Cummings, general manager; H. E. Everett, assistant general manager; and John K. Stewart, general sales manager.

Enters Equipment Field

Birmingham Steel Buildings Inc., Birmingham, will make material handling equipment in a building being constructed adjacent to its present plant. The line will include cranes, conveyors, monorails, racks, and associated equipment. T. J. Pollard is manager of the new plant.

To Buy Forging Equipment

Eaton Mfg. Co., Cleveland, will install $1 million worth of equipment at its Marion Forge Div., Marion, Ohio. The $1 million is being added to the $600,000 for improvements started late last year. The latest Marion Forge program calls for installation of a 6000 ton capacity forging press, a billet heating furnace, and the necessary material handling equipment.

Opens Service Center

Reliance Steel Products Co., McKeesport, Pa., is opening a steel service center at Tuscaloosa, Ala. Stocks will include structurals, walkway gratings, wire mesh, alloy steels, aluminum extrusions, and epoxy paints.

Micrometrical Building

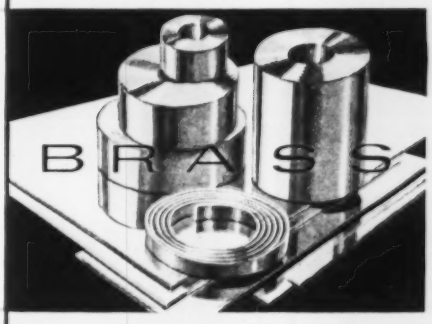
Micrometrical Mfg. Co. is constructing a plant at 3621 S. State Rd., Ann Arbor, Mich., to consolidate manufacturing, engineering, and research now in five separate buildings. The plant will have 30,000 sq ft of floor space. The company makes precision measuring instruments.

Plans Germanium Refinery

American Metal Climax Inc., New York, will build a germanium refining plant at Carteret, N. J. It will be equipped to produce germanium dioxide from both primary raw materials and scrap. The plant also will have facilities to produce germanium metal for the electron-

When you think
of product development
think of brass...
especially Western Brass...
it's "tailor-made" for each job.

Western
*



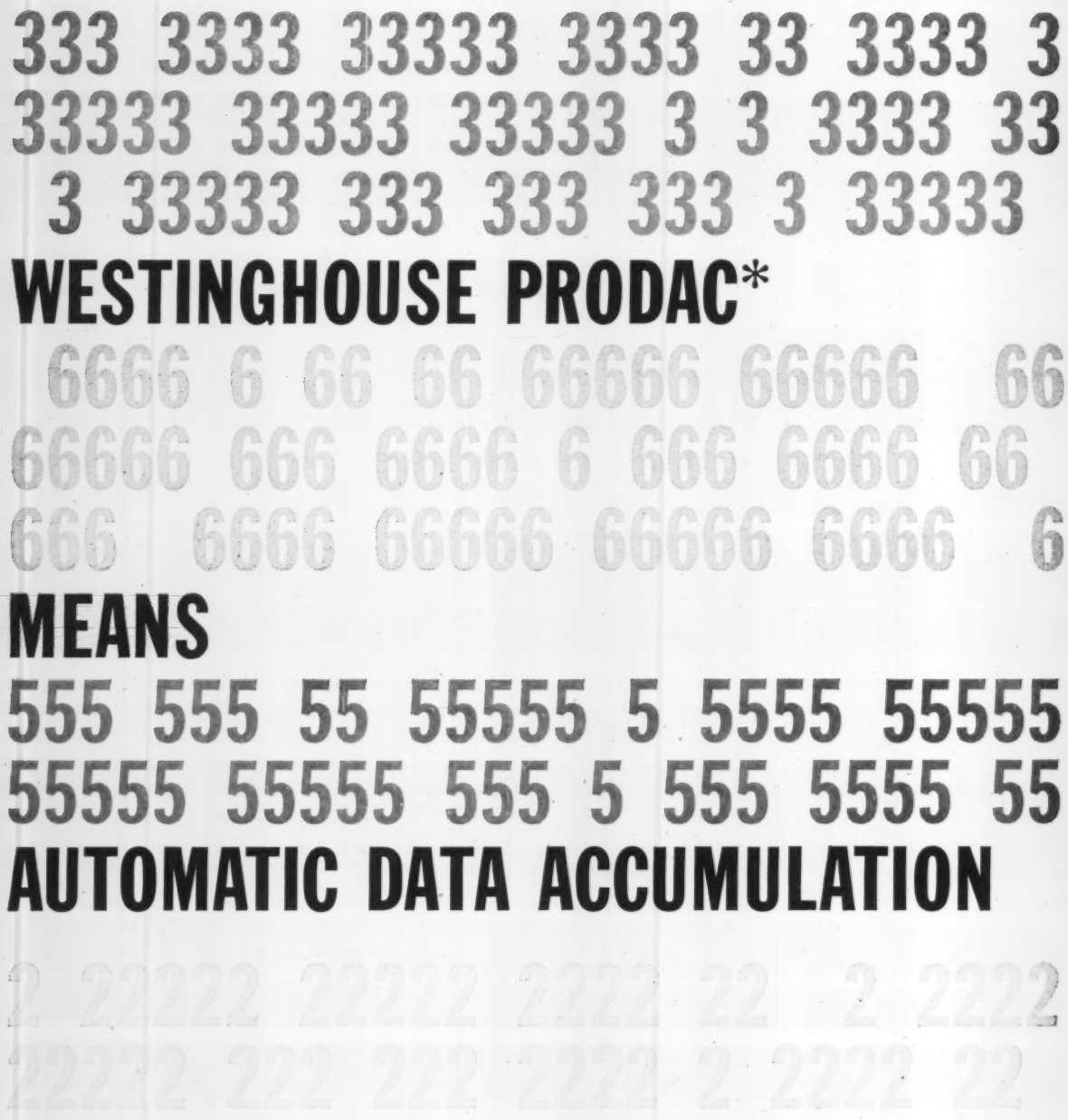
WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

THE MAN FROM WESTERN IS ONLY A PHONE CALL AWAY

OLIN MATHIESON CHEMICAL CORPORATION
Western BRASS

MILLS: East Alton, Ill., New Haven, Conn. • SALES OFFICES: Boston • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Decatur, Ga. • Detroit Grand Rapids • Indianapolis • Long Island City • Los Angeles • Milwaukee • New Haven • Philadelphia • Rochester • Rockford, Ill. • Saint Louis



. . . keeps a permanent record of each foot of production . . . automatically registers all pertinent information and spots defect locations on the full production run. This is but one of the ways Westinghouse PRODAC† is now helping bring about the "mill of the future" today through completely automatic data accumulation systems.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, blooming mills, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum, and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for future mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22124

†Trade-Mark

*PROGRAMMED DIGITAL AUTOMATIC CONTROL

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

ics industry. The unit will be situated at the plant of United States Metals Refining Co., a wholly owned subsidiary. Availability of basic raw materials for the operation has been assured by a long term contract for supplies from Africa.

Nuclear Division Set Up

Marquardt Corp., Van Nuys, Calif., has established a Nuclear Systems Div. to develop and manufacture nuclear propulsion systems and other nuclear products. The division becomes a line organization in the firm's power systems group under Don L. Walter, vice president.

TRW Gains New York Firm

Thompson Ramo Wooldridge Inc., Cleveland, has acquired a controlling interest in Magnetic Recording Industries, New York, producer of electronic equipment for educational purposes.

The company has broken ground for a $2 million plant for the Tapco Group at Anaheim, Calif. It will be used for research, development, and manufacture of aircraft and missile products. Slated for completion by early 1960 are three buildings with about 120,000 sq ft of working space.

NEW ADDRESSES

Darwin & Milner Inc., distributor of cobalt tool steels, high carbon-high chrome die steels, alloy tool steels, high speed steels, shock resistant steels, special alloy steels, and carbon tool steels, moved to its new warehouse and offices at 2222 Lakeside Ave., Cleveland 14, Ohio.

Federal Sign & Signal Corp. has moved to 136th Street and Western Avenue, Blue Island, Ill.

Central Foundry Co., producer of cast iron and fiber pipe, moved its executive headquarters to 932 Broadway, New York, N. Y.

Prenco Products Inc., producer of metal-oxide and plastic sealants for impregnation of castings, and **Prenco Mfg. Corp.**, producer of im-

(*Please turn to Page* 86)

PROTECTING THE PROTECTOR!
the unprecedented launching complex for the TITAN intercontinental ballistic missile is fully protected, above ground and underground, with
Zincilate
Artist's conception of Titan Launching Complex; Courtesy American Machine & Foundry Company.

Surfaces of structural steel and aluminum on the Air Force's Titan Missile Launcher System are protected against corrosion with Zincilate. Zincilate is supplied to American Machine & Foundry Company, associate contractor under the Ballistic Missiles Division of the USAF.

Zincilate, as modern as the missile equipment it protects, provides true galvanic protection to iron, steel and aluminum. Easily applied, before, during or after fabrication, without requiring special equipment or even mixing. Now in its 13th consecutive year of sea coast exposure tests, Zincilate has yet to show any signs of rust. Write for complete information; samples available.

PROTECTION that SELLS your PRODUCTS

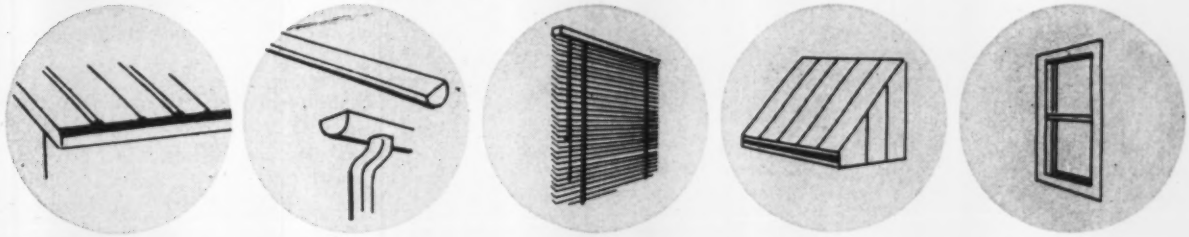
INDUSTRIAL METAL PROTECTIVES

410 Homestead Ave. • Dayton 8, Ohio • BAldwin 2-6747, 2-6748

Photo courtesy LITHO-STRIP CORPORATION, Chicago, Ill.

BONDERIZED ALUMINUM

makes your painted products look better longer



Most famous of all surface treatments for metals—BONDERITE—makes painted aluminum look better longer.

Bonderite on aluminum means fine appearance longer, because it controls corrosion and anchors the paint.

Bonderized and painted aluminum is produced on automated strip lines in which the metal is cleaned, Bonderized and painted, then re-coiled ready for use.

Stamped or roll-formed products are made from pre-painted, Bonderized aluminum coil without loss of paint adhesion, even from the most severe deformation. Here's production efficiency and economy at its best—better products at less cost.

Many Applications of Bonderite for Aluminum

There's more than one type of Bonderite for use on aluminum. In wide use is Bonderite as a base for paint, which adds durability and long life to paint finishes on so many aluminum products.

Another Bonderite produces an attractive green coating, used on many architectural products without further finish.

Protection without changing the characteristic color of the metal is provided by another Bonderite.

There is also a Bonderite, formulated for mixed production, which coats aluminum, steel and zinc.

Bonderite for aluminum meets and exceeds the requirements of Government Specification MIL-C-5541.

Well over two hundred plants—large, medium-sized and small—use these great Parker products on their aluminum production. Better investigate for *your* plant, today!

Aluminum window and screen frame sections Bonderized, painted and formed after painting. No breaks in finish anywhere! (Courtesy, Security Co., Detroit, Mich.)

SEND FOR ILLUSTRATED BULLETIN!—*Free bulletin, with more complete information and details, mailed immediately upon request. Ask for Bulletin A6790, "Bonderite for Aluminum."*

Parker Rust Proof Company

2158 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base

BONDERITE and BONDERLUBE aids in cold forming of metals

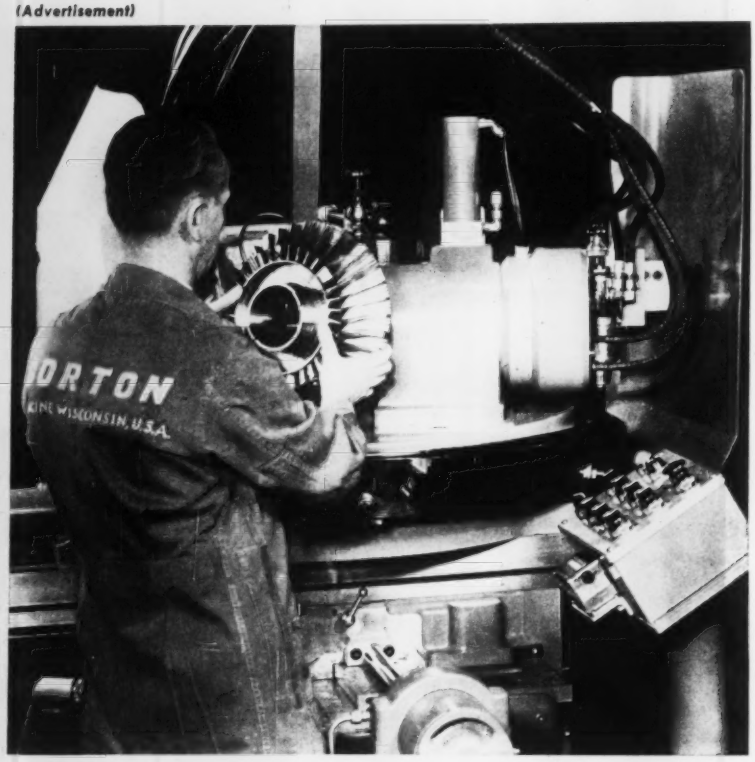
PARCO COMPOUND rust resistant

PARCO LUBRITE—wear resistant for friction surfaces

TROPICAL—heavy duty maintenance paints since 1883

**Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.*

(Advertisement)



35 complex impeller blades are profiled from the solid with this custom-built milling machine. Machining involves compound curvatures, thicknesses and depths. *Cost per piece was reduced from $1,280 to $141.

Machining Cost Reduced 89% with Custom Designed Tools

Critical and growing need for cost reduction in machining complicated parts requires machines tailored to the job.

In this period of increasing complexity of design of many parts and components and during the present evolution of harder, tougher alloys, management and methods men are being compelled to search far and wide for tools more suited to their needs than so-called standard types. In fact, the selection of specially designed tools is indicated more and more since it often goes to the heart of reducing costs all along the line.

As a case in point, the machine illustrated above paid for itself in less than two months. Production time per piece was reduced from 100 hours to 11 hours.

The machine illustrated was designed by the pioneer in the field of tracer control; it is just one of many manufactured by this machine tool builder which employ hydraulic or electronic tracers or which operate from punched cards, punched tape or magnetic tape to meet the exacting demands now present in the metal cutting field. You may have a part or problem involving cost reduction productivity, accuracy or finish. If so, you will find it worthwhile to write the George Gorton Machine Co., 2004 Racine Street, Racine, Wisconsin.

Immediate attention and prompt analysis of your requirements will be provided without obligation.

*Above figures are based on operator cost of $2.80 per hour and machine hourly rate of $10.00.

(Concluded from Page 83)

pregnation machinery and incinerators, moved to a new plant at 2605 W. 14 Mile Rd., Royal Oak, Mich.

NEW OFFICES

Tube Reducing Corp., Wallington, N. J., opened a direct factory sales office at 7256 Touhy Ave., Chicago 48, Ill. Manager in charge is R. O. Barry. The company has expanded its facilities for the production of compression-formed tubing.

Eastern Chemical Div. and **Durez Plastics Div.** of **Hooker Chemical Corp.**, Niagara Falls, N. Y., have moved to joint district offices at 120 Delaware Ave., Buffalo, N. Y. Managers of the Buffalo sales district are C. H. Foster Jr. for the Eastern Chemical Div. and Harry M. Dent Jr. for Durez.

ASSOCIATIONS

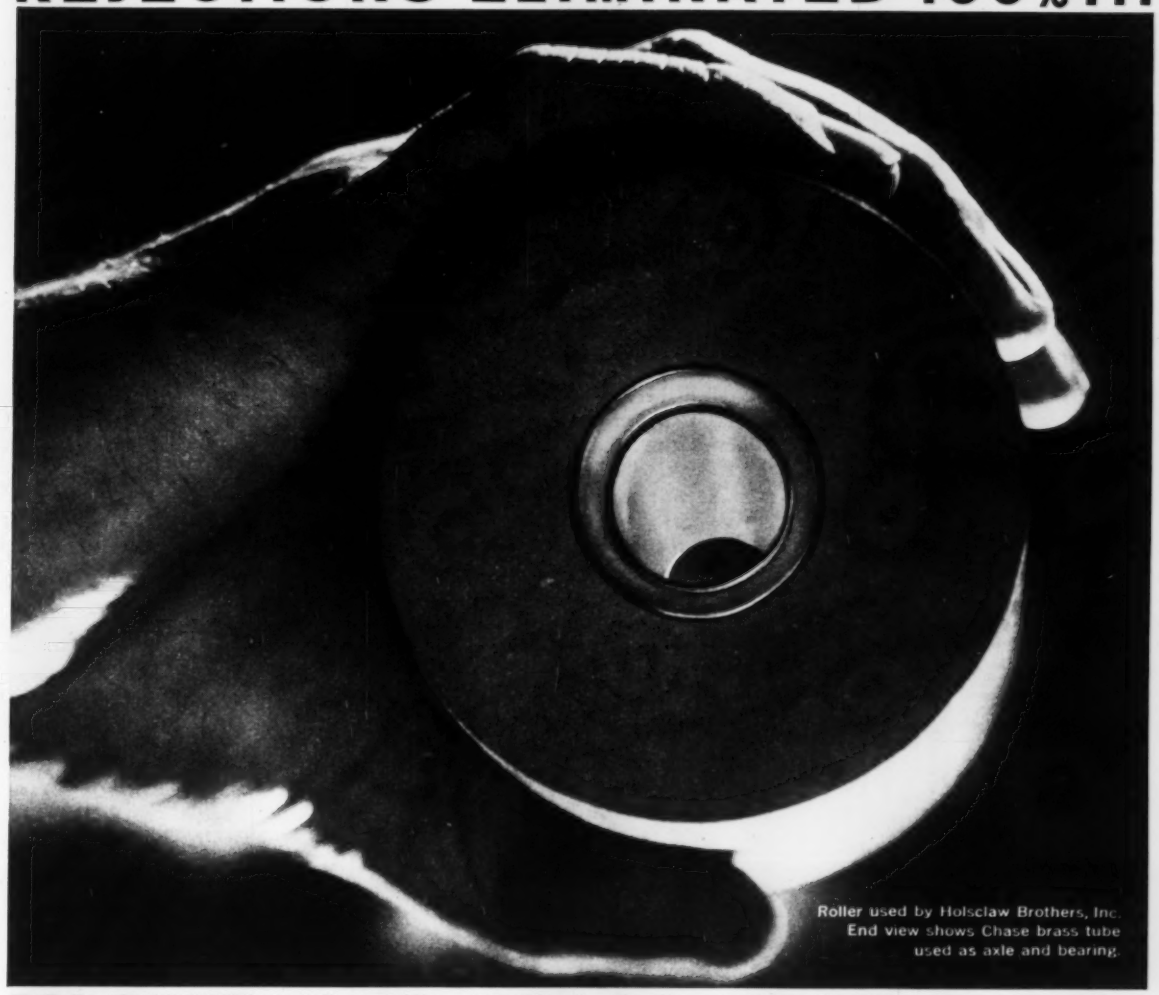
Pressed Metal Institute, Cleveland, elected these officers: President, F. F. Rimmler, Volkert Stampings Inc., Queens Village, N. Y.; secretary-treasurer, Melvin Lorentz, HPL Mfg. Co., Cleveland; honorary secretary-treasurer, W. Bryant Gemmill, American Stamping Co., Cleveland; and vice presidents, M. A. Sherwood, Grand Haven Stamped Products Co., Grand Haven, Mich., and W. J. Primrose Jr., Dickey-Grabler Co., Cleveland.

William B. Nern, Wheeling Corrugating Co., Wheeling, W. Va., has been elected president of the **National Corrugated Metal Pipe Association**, Chicago.

Metallurgical Society of AIME, New York, elected these officers effective next February: President, Dr. C. C. Long, Monaca, Pa., St. Joseph Lead Co.; vice president, J. S. Smart Jr., New York, American Smelting & Refining Co.

Society of Mining Engineers of AIME, New York, elected these officers effective next February: Presi-

REJECTIONS ELIMINATED 100%...



Roller used by Holsclaw Brothers, Inc. End view shows Chase brass tube used as axle and bearing.

BY SWITCH TO BRASS FROM STEEL!

Trailer Maker Uses Chase Brass Tube for Rollers; Ends Material and Work Waste

When we asked Holsclaw Brothers, Inc. why they changed to brass from steel in making rollers for their boat trailers, here's what they told us:

"When we started to use steel, quite naturally we had certain inspection standards set up for the job. At first the steel split on both ends, and we started our usual procedure of rejection. In a very short time we learned that with practically 100% rejection we were not getting very much production. Ultimately, we simply had to lower our inspection standards. Now, since the change to brass, to the best of the writer's knowledge and information, our rejections are zero. Not only is each part up to the standards to which we aspired, but we have no material or labor loss due to rejected parts."

When you realize that Holsclaw uses a total of ten different sizes of roller assembly, and as many as 52 rollers per trailer, the savings realized by their switch to brass become highly important. These units are made on an exclusive Holsclaw machine which press-fits brass tube made by Chase into rubber rollers. The Chase® tube serves as an axle for the roller as well as a bearing surface.

There probably are many ways that brass, copper or an alloy can save you production problems or reduce costs. Your nearest Chase representative can give you specific recommendations. You can reach him at the Chase warehouse near you, or by writing Chase at Waterbury 20, Connecticut.

Chase

BRASS & COPPER CO. WATERBURY 20, CONN.
Subsidiary of ***Kennecott Copper Corporation***

THE NATION'S HEADQUARTERS FOR **ALUMINUM • BRASS • BRONZE • COPPER • STAINLESS STEEL AND FORGINGS**
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things are popping at

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meal time
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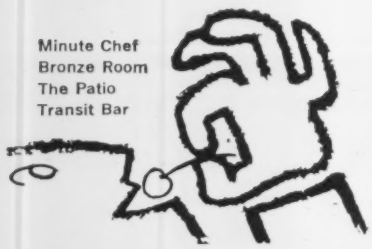


Public Square • Cleveland, Ohio
TOwer 1-8000

dent, Dr. A. B. Cummins, Manville, N. J., Johns-Manville Corp.; president-elect, James C. Gray, Pittsburgh, U. S. Steel Corp.; western regional vice president, H. C. Weed, Inspiration, Ariz., Inspiration Consolidated Copper Co.

CONSOLIDATIONS

Koehring Co., Milwaukee, acquired **Flaherty Mfg. Inc.**, Pocatello, Idaho, producer of construction and maintenance equipment. The Flaherty firm will operate as a branch of Koehring's Buffalo-Springfield Div. Gene Flaherty is general manager of the branch.

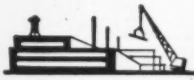
Electric Autolite (formerly Auto-Lite) **Co.**, Toledo, Ohio, purchased **C & D Batteries Inc.**, Conshohocken, Pa., producer of industrial storage batteries. The property will be operated as the C & D Batteries Div., headed by J. F. Rittenhouse.

Jessop Steel Co., Washington, Pa., acquired **Chase Steel & Supply Co.**, Los Angeles, distributor of stainless steel used in missiles and rockets. The West Coast property will be operated as a wholly owned subsidiary with Lyn M. Edgerton continuing as president.

Calumet & Hecla Inc., Chicago, is purchasing **Flexonics Corp.**, Maywood, Ill., and expects to complete the transaction in January. Flexonics makes flexible metal hose, synthetic hose products, metal bellows, expansion joints, compensators, and ducting assemblies.

Ronson Corp., Woodbridge, N. J., purchased **Cerium Metals Corp.**, New York, and will operate the property as a division of its subsidiary, Ronson Metals Corp. (formerly New Process Metals Inc., Newark, N. J.). The divisions are designated Cerium Metals & Alloys Div. and New Process Metals Div. Ronson Corp. has made an agreement with Th. Goldschmidt AG, Essen, Germany, on the use of the Goldschmidt rare earth research facilities and organization.

National-U. S. Radiator Corp., Johnstown, Pa., has purchased **Magnetic Powders Inc.**, which operates a plant at Johnsonburg, Pa. The property was obtained from Radio Cores Inc., Oak Lawn, Ill. The purchase is said to broaden the Johnstown firm's line of iron powders now produced by the company's Plastic Metals Div. A number of hydrogen reduced and other powders will also be made at the Johnsonburg plant.



NEW PLANTS

Chemical Milling International Corp., El Segundo, Calif., opened a 20,000 sq ft plant at 1330 E. Franklin Ave., that city, for production, consultation, and research in the chemical milling field. The company holds exclusive rights to the patent for contouring honeycomb core by chemical etching.

Wright Tool & Forge Co., Barberton, Ohio, is adding 12,800 sq ft to its plant. Construction is to be completed in October.

The Pump Div. of **Eaton Mfg. Co.**, Marshall, Mich., will expand facilities for the production of a controlled slip differential for passenger cars which it recently developed. Cost: $450,000.

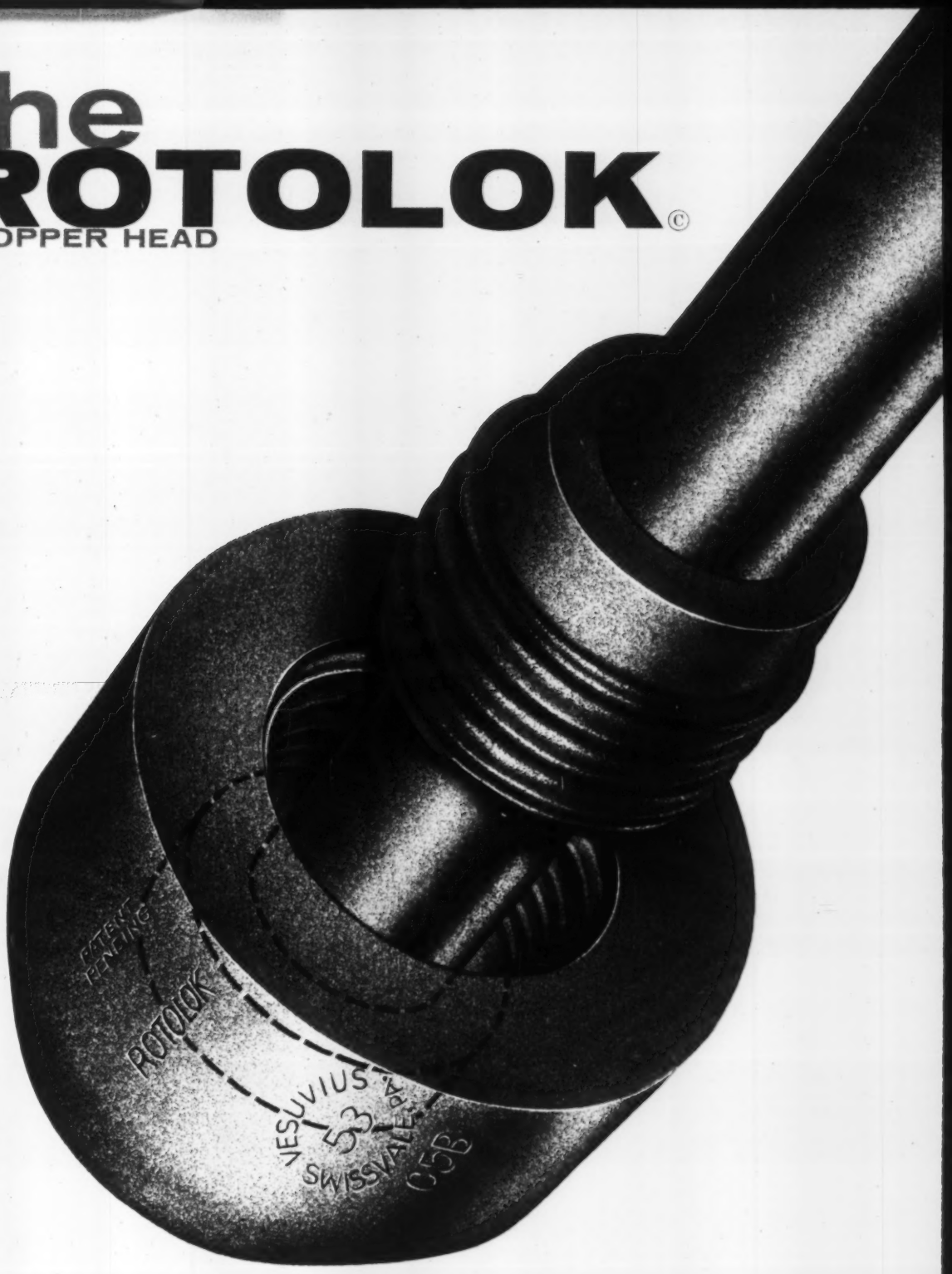
Wilamette Iron & Steel Co., Portland, Oreg., has leased a reserve shipyard at Richmond, Calif., near San Francisco, for ship repair and construction purposes and other fabricating work, ship scrapping, and general contracting work.

Daymond Co., Chatham, Ont., will undertake a $750,000 expansion program to add 35,000 sq ft to its Lacroix Street aluminum works.

Emco Ltd. has begun construction of an 18,000 sq ft addition to its London, Ont., foundry.

David White Instrument Co., Milwaukee, plans to establish a manufacturing plant in Berlin, Wis. The facility will have 52,000 sq ft of floor space and employ 60 to 70 persons at the outset.

the ROTOLOK©
STOPPER HEAD



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VESUVIUS CRUCIBLE COMPANY

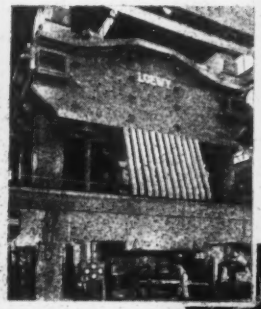
for the metal pouring industry

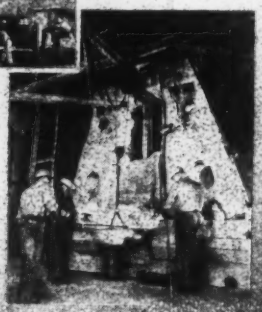
SWISSVALE **PITTSBURGH 18, PA.**

Hands of the Giants

crack an egg or shape a missile

100,000,000 lbs. of pressure—so delicately controlled that it can be made to crack the shell of an egg. Use the fabulous forces of present day forging skills to crack the barriers of space—weight, strength, high temperatures. Forge the future, today.





EST. 1883

WYMAN-GORDON

FORGING

ALUMINUM MAGNESIUM STEEL TITANIUM BERYLLIUM MOLYBDENUM COLUMBIUM
AND OTHER UNCOMMON MATERIALS

WORCESTER, MASSACHUSETTS

HARVEY, ILLINOIS
DETROIT, MICHIGAN
GRAFTON, MASSACHUSETTS
FORT WORTH, TEXAS
FRANKLIN PARK, ILLINOIS
LOS ANGELES, CALIFORNIA

Technical Outlook

October 5, 1959

SHORTCUT IN STEELMAKING — Pressure pouring, a comparatively new system of casting, is being tried out by U. S. Steel Corp., Pittsburgh. The prospect: Bypassing ingot, soaking, and blooming operations in the production of semi-finished steel mill products. It is based on the Griffin Wheel Co. (Chicago) process of pouring railroad car wheels in graphite molds.

TREND IN FINISHES— Growing use of water reducible paints for industrial finishes is predicted by Enamelstrip Corp., Allentown, Pa., a subsidiary of National Steel Corp. The same forecast has been made by Glidden Co., Cleveland (STEEL, Sept. 28). Enamelstrip is working with a number of paint producers in the development of alkyds for prefinished steel strip.

TREND IN PLANT TRANSPORT—Units rolling on rubber continue to gain popularity over rail cars for heavy intraplant transportation, says Easton Car & Construction Co., Easton, Pa., a producer of both types. The company's orders show a trend to rubber tired units in the 30 ton (and heavier) class.

ADHESIVES UP STRENGTH—Engine casings for missiles have been made nearly a third stronger by using adhesives in place of another method of joining inner and outer shells, says Republic Aviation Corp., Farmingdale, N. Y. The low alloy steel castings withstand stresses of 250,000 psi.

WATER FROM WASTE HEAT— Short on water? A distillation unit may help if you have a source that's foul or brackish. A unit with a daily output of 100,000 gallons is being installed for Southern California Edison Co., at its Oxnard, Calif., plant. It will operate with residual heat from a steam electric generator.

SHEET LUBRICANT DUE SOON— You'll soon be able to get Teflon (a plastic with lubricating properties) in sheets from 0.0005 to 0.040 in. thick, promises E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. The new form is expected to extend its usefulness: It will be easier to apply and will be cheaper (down 17 cents per unit).

ANOTHER ONE COAT PORCELAIN— Later this month, a new direct-on-porcelain process based on citric acid pickling will be introduced by Chas. Pfizer & Co. Inc., New York. Citric acid leaves the steel surface in the right condition for covering with only one coat instead of two.

ROCKETS FOR HEDGE HOPPING— Small rocket devices for lifting soldiers over low obstacles will be studied by Aerojet-General Corp., Azusa, Calif., under a contract with the Army. The firm says it already has a design for individual flight by rocket.

FORMS TUNGSTEN—The Bureau of Mines has a new way of making tubes from high purity tungsten. Described as a big step forward, officials claim the process will extend tungsten's usefulness in plating, and in defense and industrial applications. The process is said to feature a gaseous mixture which produces 99.99 per cent pure metal.

NEWEST ELECTRONIC BABY, a tunnel diode, spells greater freedom for designers of computers, radios, controlling devices, TV, satellites, and missiles, says General Electric Co., Schenectady, N. Y. This tiny transmitter demonstrates how much the device can simplify electronic construction. Other benefits: Communications at 10,000 megacycles (three times better than regular transistors); speeds 100 times faster than devices made with transistors; tunnel diodes are smaller, work at higher temperatures, and resist radiation better than transistors

Metalworking Outlook—Page 37 Market Outlook—Page 129

Hot Dies Aid Forging

Shallower drafts, thinner sections, and closer tolerances are three of the plusses cited. Cast dies and a new lubricant are part of the solution

BREAD-and-butter benefits to forgers plus better and cheaper parts for users should come from a hot die technique developed by Armour Research Foundation, Illinois Institute of Technology, Chicago.

The process will make it possible to approach finished part dimensions in the rough forging, meaning a drastic reduction in machining, and it can substantially reduce the number of die impressions in a sequence. The work was done for the Air Materiel Command.

• **Problem**—The relatively cold die has been an inherent limitation of press forging, says Paul R. Gowens who headed up Armour's research team. A hot blank forged by a cold die loses its heat so quickly that, within seconds, thin sections and completely filled deep die cavities are practically impossible to obtain. The difficulty encountered in removing the cooled part from the die necessitates a greatly exaggerated draft or edge angle.

Those shortcomings result in extensive and costly finishing to get the final part. It is not uncommon for finishing costs to exceed the original cost of the forging.

• **Barrier**—The first challenge facing the team of metallurgists was to find a new die metal. If conventional steel dies, heated to 1600° F, were to press down on a stainless steel blank heated to 2200° F, both would deform. A die was needed that would retain its compressive yield strength, as well as its resistance to oxidation, at those temperatures.

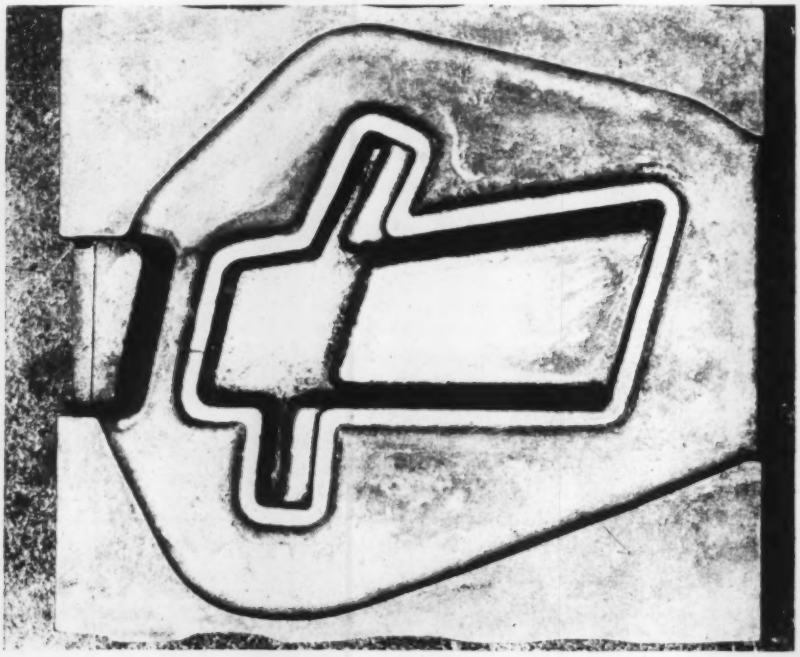
Two commercial alloys were selected—Inconel 713C, the first choice, and another that subsequently failed.

Both alloys were unmachinable; conventional techniques for sinking the dies were useless. The difficulties led to a research effort aimed at a suitable method of casting the die.

Sand casting had limitations which made it unsatisfactory, so the team developed a new technique using a moldable graphite mixture.

Both alloys were cast without difficulty (the second choice cracked under stress), and the Inconel 713C dies successfully forged a variety of shapes at temperature-pressure couplings up to 1600° F and 80,000 psi.

• **Solutions**—The dies are assembled from four cast layers. The first layer has the impression cast in. The second layer has a series of slots (six or seven) and each slot



Cast from Inconel 713C, this die is heated with Calrod units (20 kw) that will hold its temperature at 1600° F. The dies are cast in a moldable graphite mixture. No machine finishing was needed

becomes a container for four Calrod units. Each die half has Calrod units totaling 20 kw.

The lubricant used on the hot dies, another development which came out of this project, is a mixture of graphite and a salt (potassium iodide) that is applied to the die in powder form. When the mixture hits, the salt melts and becomes a carrier for the graphite.

Armour spokesmen report forged parts lived up to expectations. Thin sections were formed easily, and the precision and intricacy of the forgings markedly exceeded those produced with standard methods. The ease of forging promises to shorten the sequence of dies now required to obtain difficult shapes. The reduced draft, coupled with the new precision, brings finish machining to a minimum.

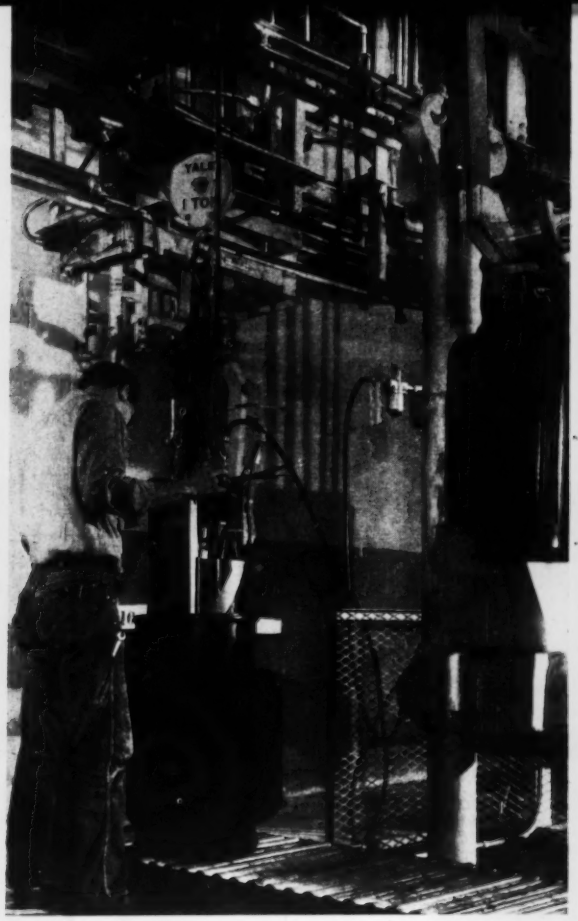
• **Potential**—Not only do the hot dies eliminate many problems; they open whole new areas of application. Many metals, such as those in jet aircraft parts, which can be forged only in a narrowly limited temperature range may now be more readily shaped.

Hotter dies, stronger die metals, and further refined casting methods will carry with them even better quality and economy for the forging industry.

Paul R. Gowens (left) and an associate, Andrew Murphy, examine a test part. Mr. Gowens, who headed up the research project at Armour, tells STEEL that several major forging companies are looking into the process

As-forged steel parts (blanks are heated to about 2200° F) have a good surface finish. Walls or sections can be relatively thin with small draft angles. As with this part, finish machining can be held to a minimum

Distribution transformer tanks get their start here. Flat sheets are formed (bottom), welded (center), and pass on to more than 15 large, automatic machines for further operations



Tank entering assembly area from overhead storage conveyor. Lowering device is a good example of the complexity of the 5-mile-long system which eliminates hand transportation

Redesign of Product Triggers Many Benefits

THE REDESIGN of a product (distribution transformers) made it possible for Westinghouse Electric Corp. to put in a highly automatic production line when it moved into its new plant at Athens, Ga. Several gains have resulted.

• The new units reflect more efficient ways of making and assembling the metal components, particularly the electrical parts.

Production costs are lower, says Westinghouse, because design and manufacturing engineers simplified the coils and cores. In the new coil design, high and low voltage conductors and insulation are tightly wound in successive layers. Solid cooling duct spacers, windings, and insulation are resin treated to bond them into a more compact structure than the old type. In the bigger sizes, low voltage coils are wound with strip copper, one turn per layer.

That's simpler than winding the inner and outer low voltage sections separately. High voltage sections used to be multiple wound on a tube and sawed into sections, one coil to a section. They were then telescoped and alternated with low voltage sections by hand.

Advantages of the new method: Unusual resistance to short circuiting; 40 per cent less impedance; quieter operation because of the tighter fit between high and low voltage coils; weight reduction because of fewer turns and braces; obstruction-free ducts which give cooler operation. Primary current requirements have also been cut 30 per cent.

The cores are made by winding a special steel (Hipersil) into a multilayered ring which is sawed through on one side. Each layer or lamination is displaced slightly to form a saw-toothed effect at the junction. After forming, annealing, and reclosing, the core is mag-

netically the same as an uncut counterpart.

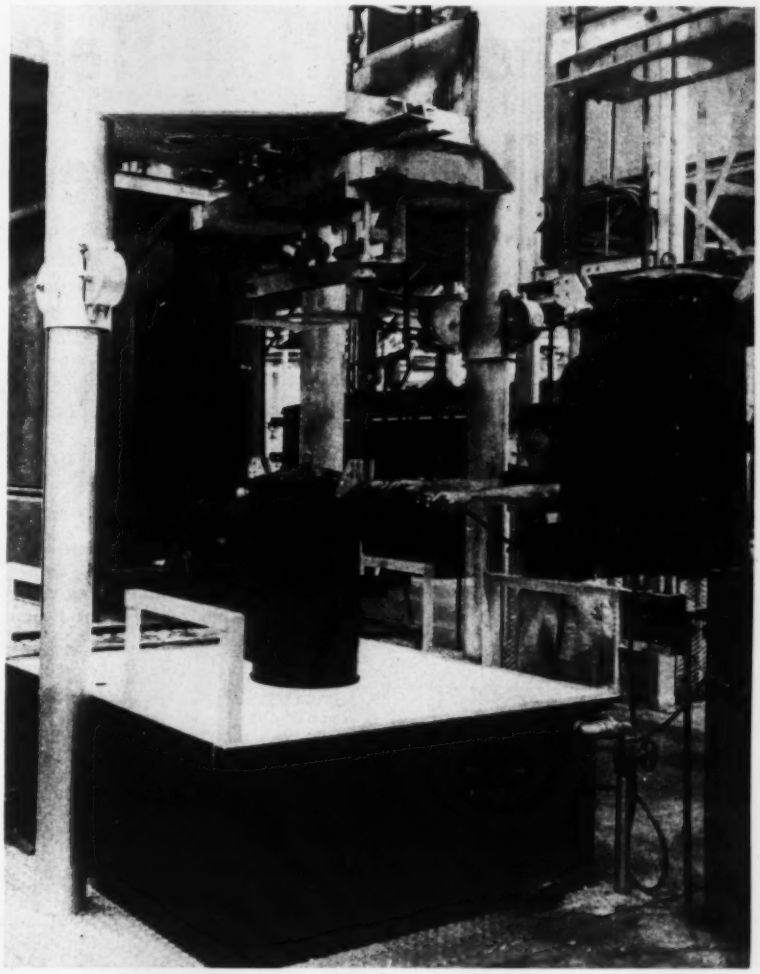
• Transformer tank redevelopment involved making the automated line handle several styles on the same machines without extensive setup changes.

The tank line starts with flat sheets. Fifteen large machines are tied into ten automatic positioners, two turnovers, and more than 500 ft of powered roller conveyors.

A magnetic destacker first feeds resquared sheets into a press which punches a locating or tooling hole and stamps a part number. Sheets are then rolled into a cylinder and fed continuously through an arc-welder which joins the seam. Grinding removes 3 in. of weld at each end and a breakoff separates the continuously welded shells into individual containers. A power conveyor takes the shells to beading and flanging machines. Subsequent automatic operations install cooling fins, mounting lugs, and ends.

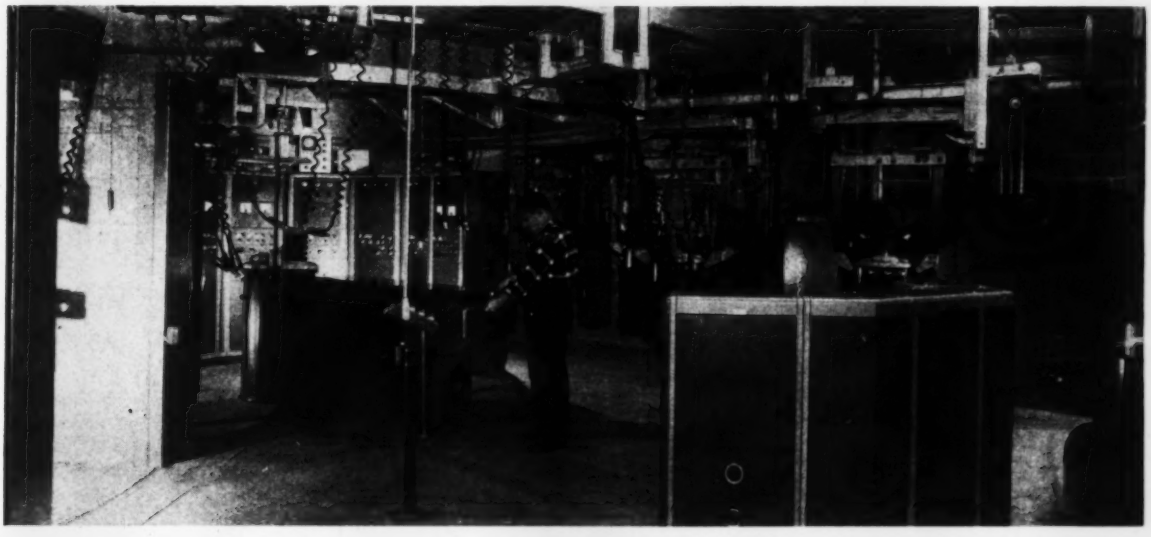
Each tank gets a Zyglo (ultraviolet light) inspection before painting to check leakers. Tanks are upended in a cabinet while an oil containing a fluorescent material is sprayed inside. The operator merely watches for telltale glows under an ultraviolet lamp.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Transformers are tested with air pressure under water to double check leaks. For first check, containers get a fluorescent Zyglo spray just after welding

Automatic inspection device tests electrical performance, accepts or rejects, and records results. Programing and sequencing are set with an electronic Cypac unit



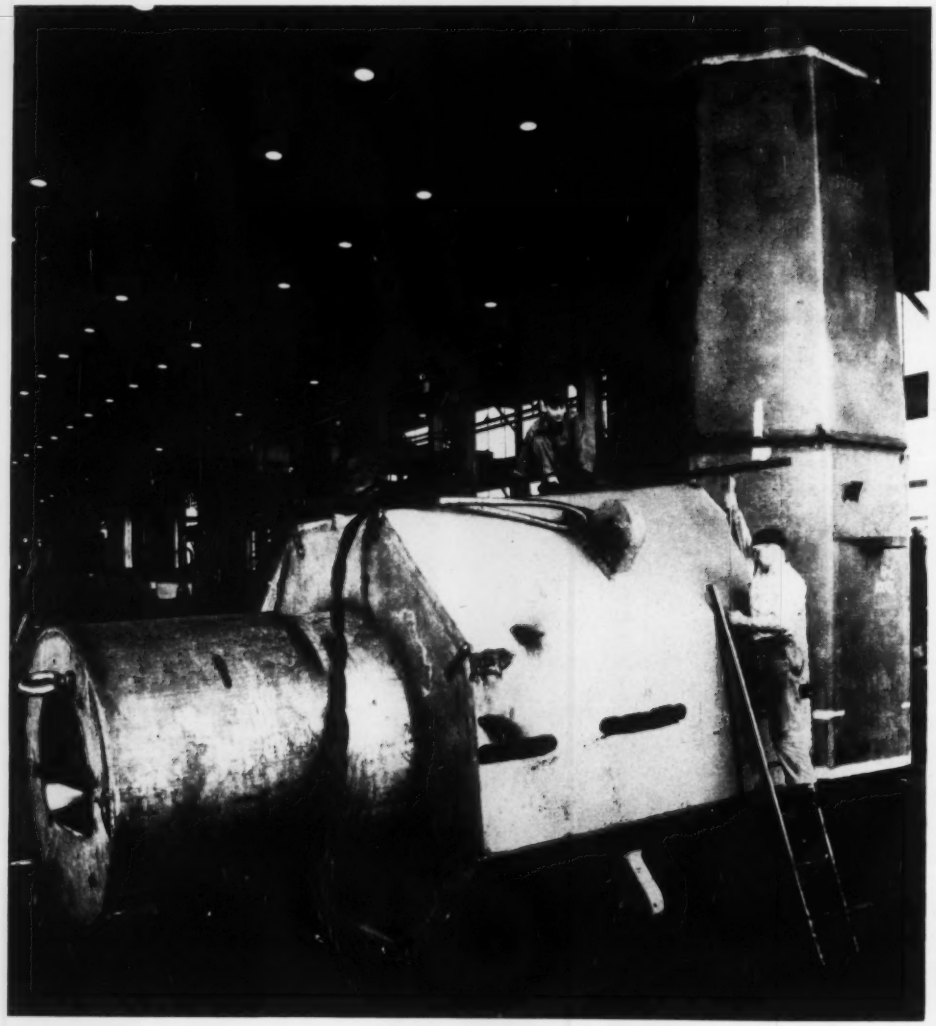
Fabrication of Huge Telescope Poses King-Size Problems

THE RADIO TELESCOPE being installed at the new National Radio Astronomy Observatory, Green Bank, W. Va., is posing a number of unusual problems at E. W. Bliss Co., Canton, Ohio.

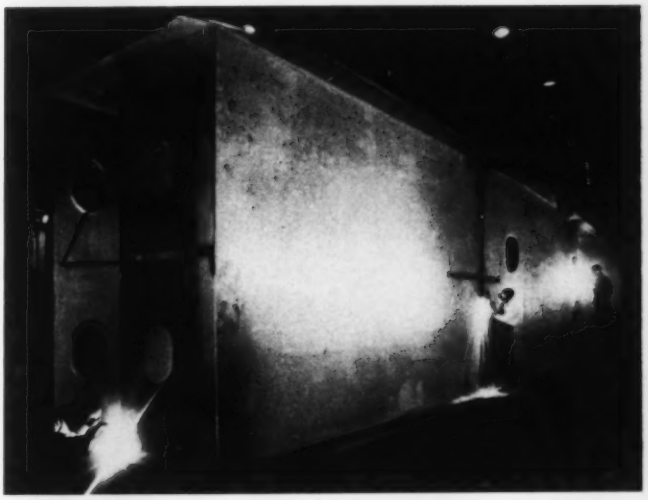
Reasons: Although the instrument is huge (some sections weigh 800 tons), it must be unusually precise. An additional complication is involved: A 22 ft spherical bearing will have to be machined on the erection site. The turning must be accurate to within 0.005 in., which is five times more accurate in proportion than a 1 in. ball bearing machined to plus or minus 0.0001 in. Bliss engineers will set up a lathe headstock, gages, and checking equipment at Green Bank.

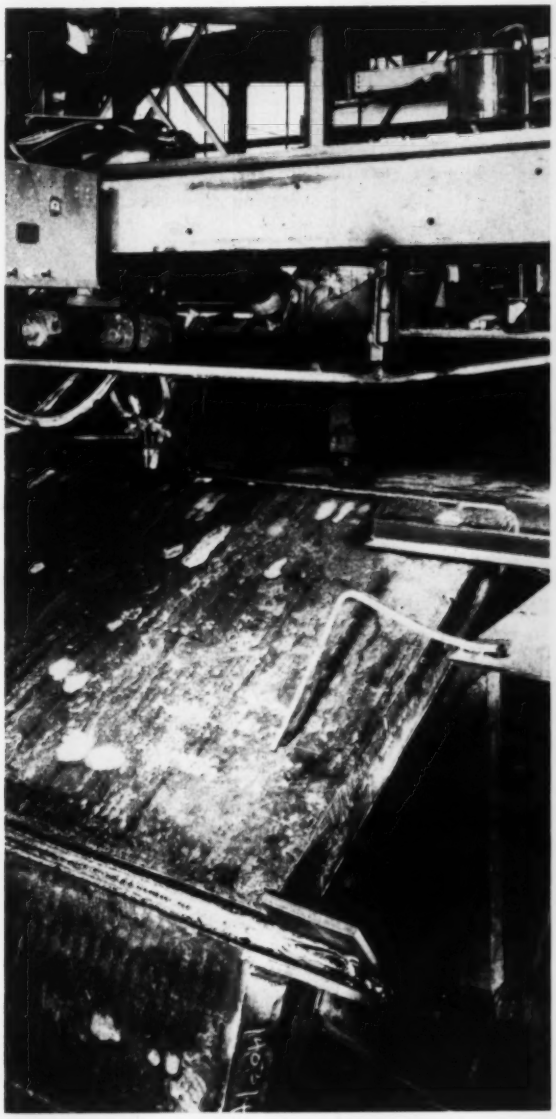
The telescope will be used to check radio signals originating more than 10 billion light years away. Signal intensity is extremely low—less than the equivalent of a 1 watt light spread evenly over the whole earth.

Assembling and joining 800 ton polar axis shafts (over-all view on left, close-up on right) take place in a pit to permit use of two radial drills which carry two welding heads. Units can be adjusted in three dimensions, but radial drills travel the length of welds on rails mounted alongside pit. Each 15 ft joint required 79 passes



Unusual size is depicted by this beam which is one of two arms that make the yoke for the 140 ft dish. Sections like this one create ticklish shipping problems. Railroad structures along a 4½ mile stretch near Youngstown will have to be removed. In other places, the train will inch along while brakemen walk beside car to check clearances. Assembled yoke weighs 1250 tons





HOW TELESCOPE WORKS

Radio waves from remote stars and space rockets will be gathered by the telescope's 140 ft reflector and concentrated on radio antenna. Precision mechanisms are needed to aim instrument accurately.

Teeth for the polar axis gear must be placed within 0.002 in. along the circumference of an 85 ft circle. Ordinary 42 ft television mast is mounted on a radial drill placed at the center of the circle. Scribing tool on the end is located and adjusted with optical instruments. After assembly, gear and gear girder must not deviate more than 1/16 in. from a perpendicular to the polar axis shaft

COST CRISIS . . . How to Beat It

These were the trouble spots

Studebaker-Packard production men encountered two kinds of trouble in the Lark station wagon quarter panel stampings:

DIE SPLITS
The panel was scrapped

WRINKLES
Reworking

DIE SPLITS
Excessive welding and finishing

S-P managers report a switch to killed steel eliminated die splits and trimmed the wrinkle incidence by about 70 per cent.

SAVED: $42,055 in model year

Steel Switch Solves Stamping Problem

Scrap and rework costs both plummet with the use of a higher quality steel for the job. The article is an entry in STEEL's Cost Crisis Awards Competition. Another article in the series will be published next week

SHORTLY after Studebaker-Packard's 1959 model Larks went into production, stamping experts became aware of excessive scrap, welding, and metal finishing costs on station wagon quarter panel stampings.

Cost problems were turned up in the weekly excess labor and scrap reports. E. J. Lievens, manager of the corporation's stamping plant in South Bend, Ind., says several solutions were considered.

• **The cost problems were attacked by a team consisting of stamping plant management, manufacturing engineering representatives, and men from manufacturing research.**

First, the team recognized that the part design presented an inherently difficult drawing operation. Although die modification was considered, the team concluded that would be an expensive (and perhaps, unnecessary) step.

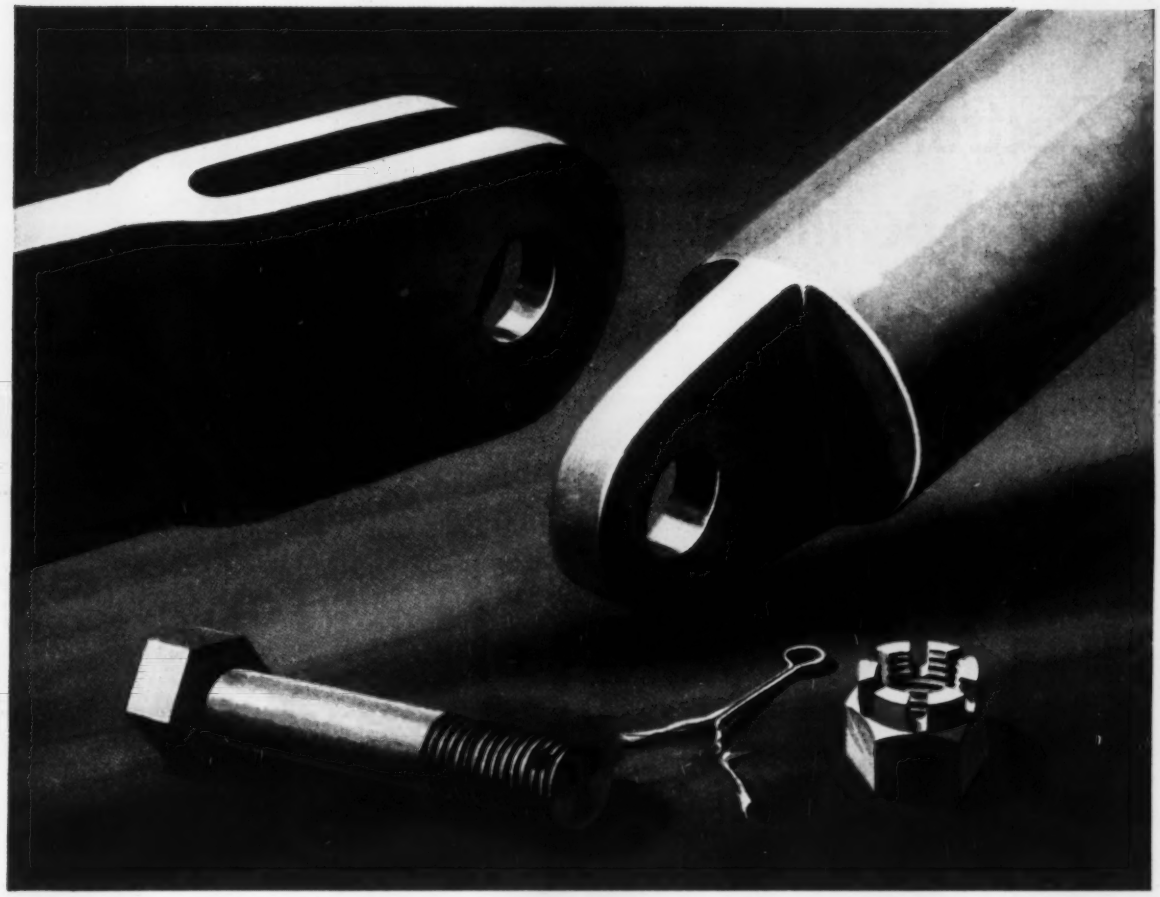
Final proposal: Try a better grade steel for the part. A switch was made from rimmed to killed steel. Following a tryout run, data showed that all facets of the excess cost had been brought under control.

• **Killed steel became the permanent material for the job. In addition to labor and scrap savings, a possible costly bottleneck was averted.**

The higher grade steel naturally cost S-P more than the rimmed steel. Based on the model year, the increase in material costs was figured to be $17,929.

That increase was offset by decreased scrap, welding, and metal finishing costs totaling $59,984, bringing net savings to $42,055.

And, points out Mr. Lievens: "This does not include additional overtime and other overhead costs that would have developed had the condition been allowed to continue."



Somebody saved 1/4¢ on this fastening

But something was missing when costs for the castellated nut and cotter pin unit were figured. The extra expense of field service calls; the cost of "downtime" to the customer; the value of your company's reputation as a manufacturer. Add these factors in . . . then the one quarter cent for the **double dependability** of an Elastic Stop nut becomes the lowest cost insurance you can obtain for the protection of your equipment and your reputation.

No component, part or material which fails under the stresses of normal product performance can be economical . . . no matter how low the initial cost. Failure of the smallest part is failure of the equipment.

Because they cannot be shaken loose . . . because the exclusive nylon locking insert retains original locking torque throughout the most rugged operating conditions – Elastic Stop nuts insure against breakdowns through fastener failure. And, because Elastic Stop nuts eliminate the possibility of product failure caused by loosened fasteners . . . *they are truly the most economical fasteners available.*

For detailed photos showing how some of America's foremost manufacturers of heavy equipment have insured critical bolted connections with Elastic Stop nuts on such units as rock drills, scrapers, snow plows, off-the-road trucks . . . write to ESNA. Or, for first hand proof, tell us the preferred size and we'll send you test samples. Address: Dept. S24-1060, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.

DOUBLE DEPENDABILITY

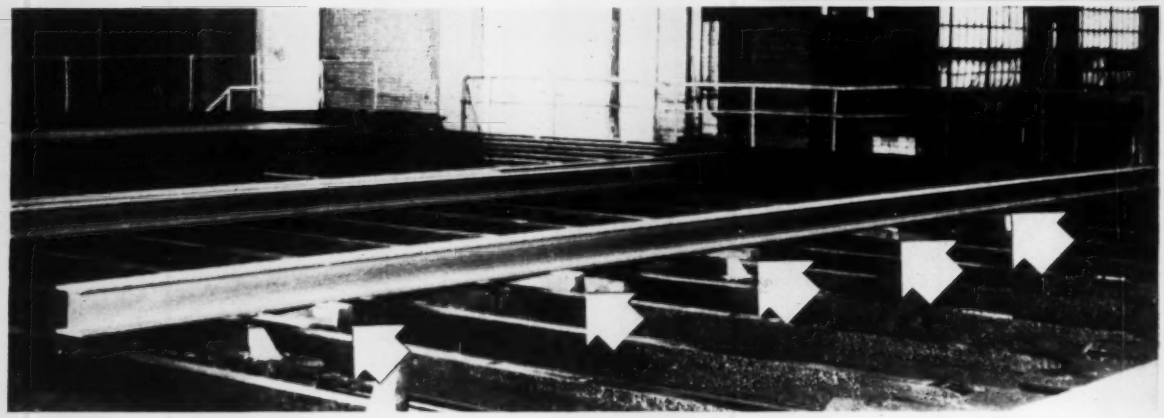
The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA

Electronic Weighing Ups I-Beam Quality

System weighs whole beams as they come from the mill, permitting quick adjustments to correct for overweight or underweight. Previous setup was slower and handled only small samples cut from the beams



Beams are lifted from the hot bed (above) by support rails, mounted on a weighing platform under the bed. Load cells under the corners of the platform send electrical signals to a console (right) that registers weight of the I-beam on a calibrated dial, or prints it on a card

A LARGE eastern steel mill is reducing rejects (rolling I-beams that are overweight or underweight) via electronic weighing.

Right after beams are rolled, they are weighed on a retractable platform resting on resistance load cells. The cells were supplied by the Electronics & Instrumentation Div., Waltham, Mass., of Baldwin-Lima-Hamilton Corp.

• Load cells, the basic elements, are simply constructed and easy to use.

A matched set of four bonded wire strain gages is fixed on a high strength steel column, machined to close tolerances. The four gages are connected electrically in a Wheatstone bridge circuit, initially balanced. The circuit includes compensating resistors to provide accurate measurements over a wide temperature range.

A load placed on the cell compresses the steel column, distorting the resistors and changing their value. That unbalances the bridge circuit, producing a voltage variation. The variation, when amplified and applied to an appropriate meter (calibrated in pounds), indicates the exact load.

• The system permits faster adjustment of mill rolls to correct for underweight or overweight beams.

Each long beam, rolled from an ingot of steel, is cut into shorter lengths and taken to one of four hot beds (parallel rails 8 to 10 ft off the ground) for cooling. Beams are weighed at the front of the hot bed.

Eight support rails, resting between hot bed rails, are secured to a platform below the bed. The platform rests on four 2000 lb load cells—one at each corner.

Under each load cell is an elevating device that lifts the platform to bring support rails above the hot bed level. The support rails are below the hot bed, except when a beam is being weighed.

Most of the beams weighed are 40 ft long and weigh 400 to 2500 lb. Capacity of the hot bed limits beam length to 50 ft.

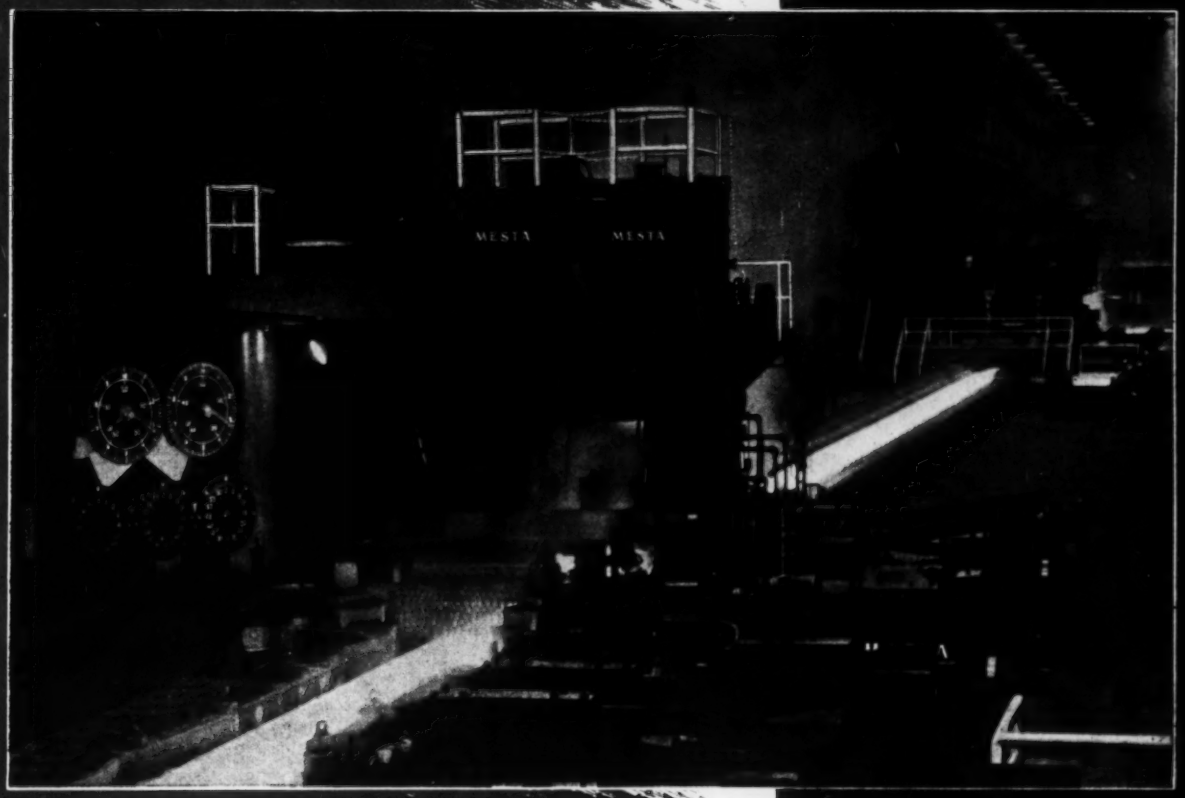
• Absence of moving parts makes for easy maintenance. Calibration takes only a few minutes.

Dust, dirt, and oil don't affect

HOT STRIP MILL

Designed and Built by MESTA

FIRST with fully automatic controlled roughing mill



MESTA 44" Hot Strip Mill installation . . . including Vertical Edging Mill, Universal Reversing Roughing Mill, and six Finishing Mill Stands with three Finishing Vertical Edging Mills . . . at the Aliquippa Works of Jones & Laughlin Steel Corporation.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

the system's accuracy. Load cells are enclosed, and the system has no moving parts that can be damaged. Electric cables carry load signals to the dial system; no bearings, hydraulic systems, or pivot points have to be lubricated or maintained.

The setup is calibrated once a week. Weights, placed on the support rails, simulate a beam of known weight while the dial system is being adjusted. The company plans to suspend an accurately weighed beam above the hot bed and lower it to the support rails for calibration of the scales. That will permit the system to be calibrated faster (it now takes 20 to 30 minutes).

• Previous weighing method: A sample, cut from an I-beam, was weighed on a mechanical scale, and the weight of the 40 ft lengths was determined by extrapolation.

Samples cut from I-beams had to be taken to another building to be weighed. Even if errors were detected, several pieces were rolled before mill corrections could be made.

The sample weighing method wasn't reliable. The sample often didn't represent the average.

Oil-Sand Binder Improves Castings

An oil-sand binder (called Britecast O) sharpened casting quality in several trials made by Minerals & Chemicals Corp. of America, Menlo Park, N. J. Results were especially good with nonferrous castings, such as magnesium and aluminum.

The material makes it possible to produce precision castings with green sand equipment, says the company. Steam doesn't escape during pouring, so finer sand grades can be used.

The binder is used with mineral oil and fine silica sand. It takes 3 to 5 minutes to mull a 100 lb batch. Flammable or toxic solvents are not required during mulling.

Sand bonded with the material is almost 100 per cent re-usable, and makeup is low, says the company. Water sands can be converted to the binder after drying. Synthetic sands bonded with modified bentonite can be converted progressively by adding enough of the binder to maintain green strength until conversion is complete.

World Tool Bout Gets Rough

Industry moves abroad are called mixed blessings. They alleviate some competitive troubles but don't solve the basic problem of a noncompetitive U. S. economy

SEPTEMBER was machine tool month in Europe, and a fair share of this country's machine tool bigwigs participated.

A colossal European Machine Tool Exhibition was going on in Paris (1001 builders from nine countries showed off some 3600 machines), but the turnout of U. S. industry officials is explained by an even more important reason: Domestic builders continue to shop for European connections that can make them world contenders in the machine tool market.

A French machine tool builder told STEEL's European correspondent, Dr. Herbert Gross: "American machine tool representatives are chasing through Europe like sharks, trying to swallow whatever firm they can get control of, and you can't blame them."

Dr. Gross reports that most European builders agree with the Frenchman; the partnership of the U. S. and foreign builders is a natural if Americans intend to preserve their cut of the world market.

• But the domestic industry is convinced the move abroad is, at best, a mixed blessing.

"The solution seems to be a good one, but the problem we're solving is ridiculous."

That pretty well summarizes many domestic builders' views on their moves to snare a bigger hunk of the world's machine tool business. The solution is aimed at giving U. S. builders the advantage of European building costs and labor rates which are 50 to nearly 85 per cent less than they pay here.

As for the problem, the industry is explaining it to officials in Washington with a set of facts intended to dramatize both the complexity and severity of their plight.

Take these: U. S. builders pay production workers about $2.40 an hour, while their competitors abroad pay 35 cents to $1 an hour. The wage factor alone is important since roughly 50 per cent of the cost of a domestic machine tool is tied up in wages and salaries.

Those rates, builders warn, permit competitors to continually underbid domestic prices. Though U. S. builders used to have the edge in both productivity and accuracy in most machine lines, they feel the advantages have nearly evaporated.

So domestic builders are forced to compete in the world market against equivalent machines priced 20 to 50 per cent under ours.

Result: Exports of standard machines have dropped roughly 40 to 75 per cent since 1952—depending on the type machine.

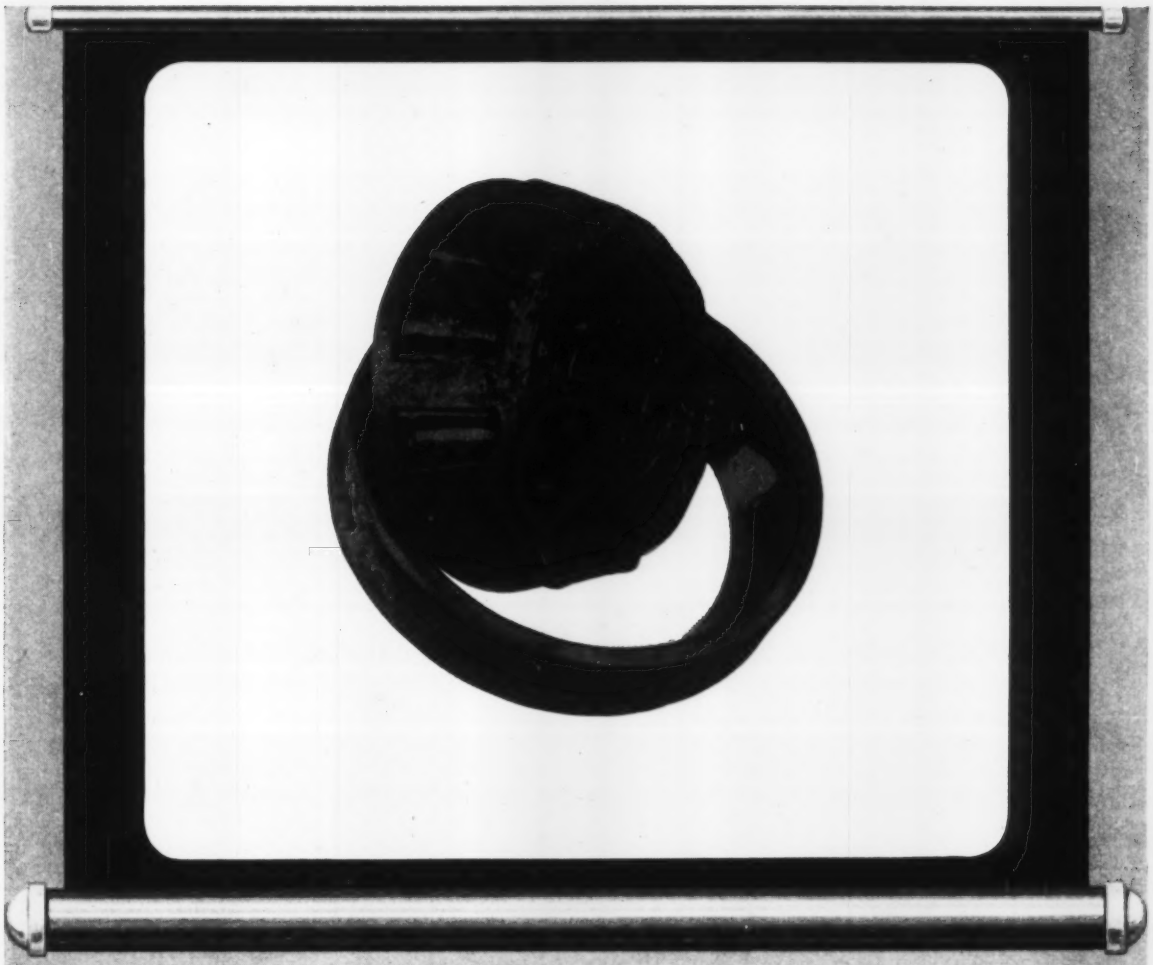
Armed with such data, the machine tool industry is talking about the importance of depreciation reform, of intelligent buying by government branches, and of other measures that would help the industry wage a better marketing battle.

Tooling Efficiency

Most machining experts agree that industry generally is doing a less efficient job of metal cutting than it could. Specialists at Wesson Co., Detroit, ran a six month study that shows the savings you can get by using the right turning tool.

Wesson's midwestern sales engineers collected production data to find out the average, total costs for using the three basic tool types, brazed tips, throwaway inserts, and slug inserts in band-type holders.

Their conclusion: Savings of up to nearly $1 a cutting edge can be made when a switch from brazed to throwaways is possible; slug inserts can reap even greater savings in some cases. Wesson engineers, who help market all three types, figure such savings ought to be too good for users to pass up.



Picture of a needless expense— filmed to help management prevent it

The film clip is taken from a Texaco movie about grease, called "Shear Magic." It shows a grease-lubricated ball bearing that has literally been eaten up by rust because improper lubricant was used.

To help you take steps to prevent this same occurrence "Shear Magic" presents the latest advances in greases and grease-testing methods.

You will see how *only* the right greases protect against heat, water, cold, dust, shock, and other conditions. You will find out about new greases, their components and capabilities.

You will learn how the right grease schedule—one planned exactly for your operation—can help you reduce maintenance and replacement costs and substantially improve your company's profit picture.

There is no "hard sell" in "Shear Magic," only informative talk. Texaco will be glad to arrange for a showing of the 25-minute sound film right in your plant. To start the projector rolling, just mail the coupon.

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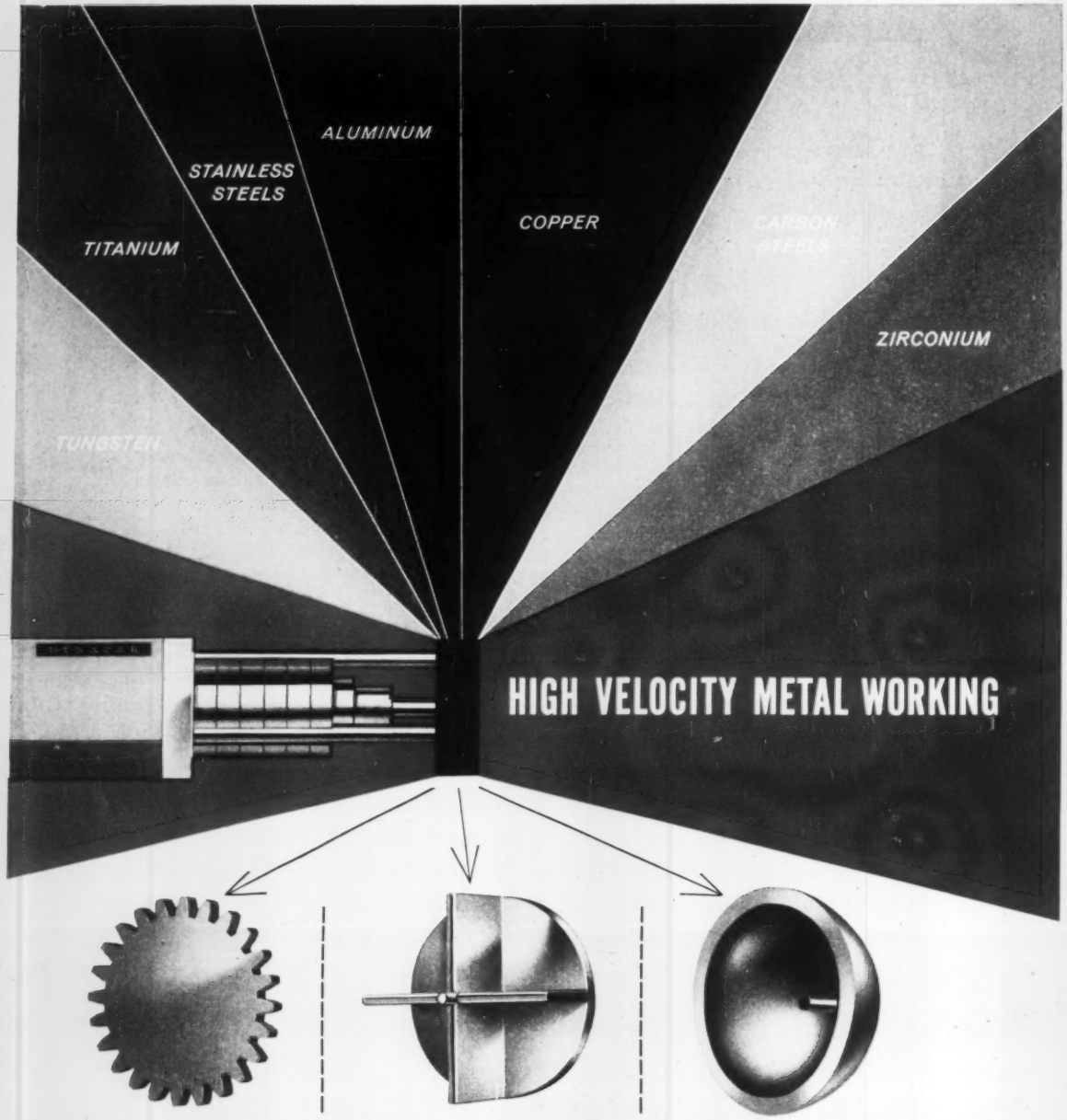

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Tape Control Speeds Jet Plane Output

Machining and tooling costs cut drastically; company finds system has many other advantages

PRODUCTION officials at Republic Aviation Corp., Farmingdale, N. Y., credit numerical control with helping them turn out the first F-105D fighter bomber three weeks ahead of schedule.

James J. Childs, program director, says: "On machining costs, this kind of control saves us between 65 and 85 per cent, and the tooling costs run about 60 per cent below those for the conventional semiautomatic methods."

• **Example**—On one complicated part, a three-dimensional aluminum wing spar cap, it took 625 hours to prepare the control tape, or transfer blueprint information to the tapes.

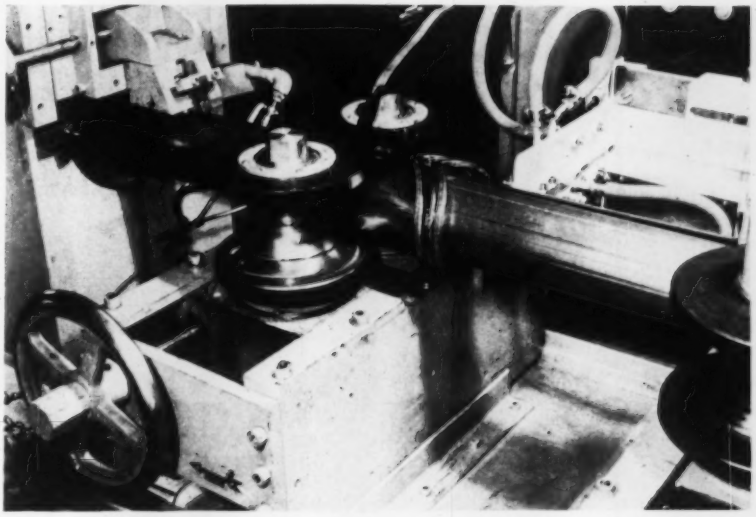
"Conventional methods, which would require fabrication of a model to guide the semiautomatic machine, would take some 1500 hours," says Mr. Childs.

"Furthermore, the actual machining takes 6 hours as contrasted to 26 hours by conventional procedures," he reports.

• **Other Benefits**—Mr. Childs points out that numerical control pays off in other ways besides tool and machining costs. Tool storage costs are reduced, leadtime is cut, and inspection costs drop. Then, too, he says, there are advantages in quality control, and a lower capital investment is required since fewer machines will do the work.

Early this year, Republic put its fifth numerically controlled machine into production. The machine battery is made up of two profilers, two skin mills, and a five axis profiler.

• **Other Uses**—In addition to the variety of machining jobs done on the machines, Republic production men intend to extend the use of the machines to other jobs, such as spotwelding, jigboring, lofting, drilling, and turning.



Multiple turn "hairpin" coil delivers energy to weld tubing as it passes through guide rolls. Bend in coil concentrates the energy along weld line

High Frequency Welding Speeds Mufflermaking

MUFFLER tubing for 1960 automobiles is being welded at speeds up to 150 fpm, more than 65 per cent faster than the former method.

The technique applies current, alternating 400,000 times per second, to 0.048 in. mild steel strip being formed in a tube mill made by Gordon & Morgan Machine Co., Lincoln, Nebr.

Resulting welds are said to be exceptionally strong: A 4 in. tube, for example, can be expanded to 5¾ in. without breaking the weld; specimens can also be crushed or collapsed completely without damage, claims Induction Heating Corp., Brooklyn, N. Y., which makes the electrical-induction part of the equipment.

• **Only one operator is needed to handle the setup, which is fully automatic.**

The induction heating (Ther-Monic) unit replaced one which used 60 cycle current. High frequency requires less energy to make a weld (about one third that of the old equipment). The heat pattern is considerably narrower too—penetration is about 0.025 in. on each side of the mating surfaces. In addition, deterioration of adjacent metal has been practically eliminated.

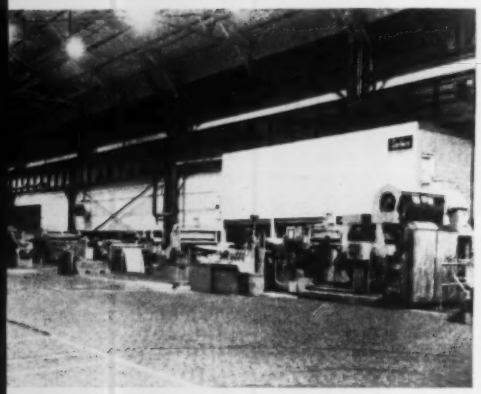
• **High frequency current permits the use of thinner metals than is possible with regular resistance units.**

Traditional methods require some pressure on the tubing walls to produce good welds. The new unit needs no pressure so no mechanical or electrical connections are used.

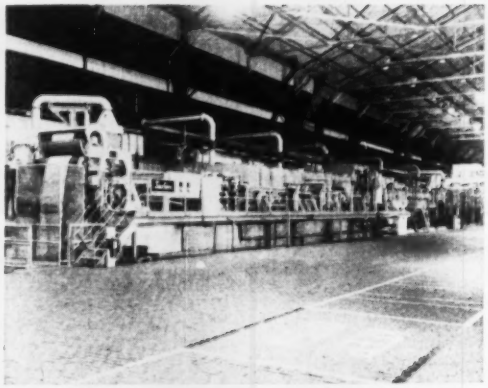
Tubing production starts from strip stock which is fed into the roll former from a reel. When in shape, the tubing passes through a multiple turn "hairpin" coil which induces enough heat to bring abutting surfaces to joining temperature. Welds have a slight flash. Muffler people don't object to that, but ironing rolls smooth and cold work the seam to strengthen it and improve appearance. After cooling, straightening, and sizing, tubing is cut to length by a flying saw.

complete normalizing line:

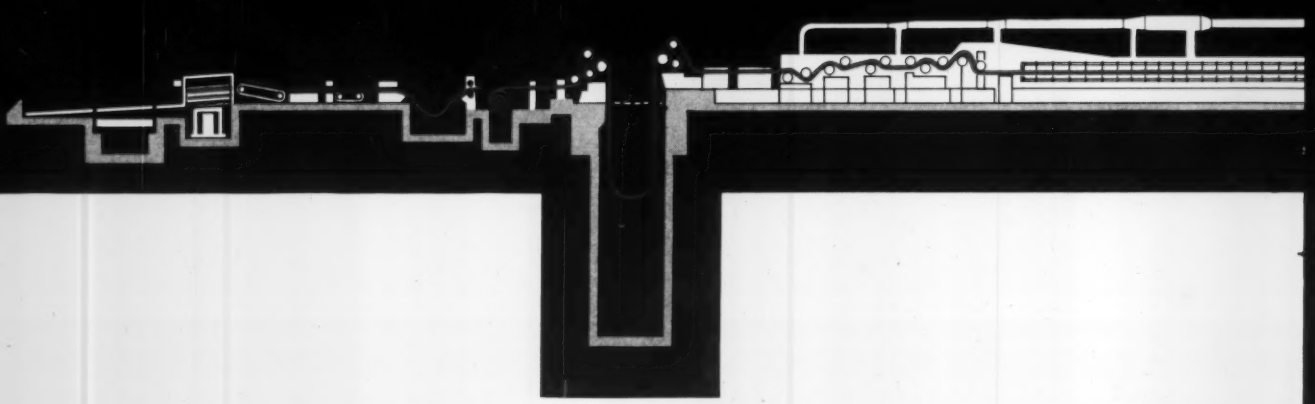
ALL SURFACE!



Exit end of the line, showing looping pit, "recoiler," automatic shear and sheared sheet piler.



Pickling section includes acid bath, water rinse tank, brush scrubbers, alkali tank and dryer, all installed by Surface. This view shows the exit end of the section.



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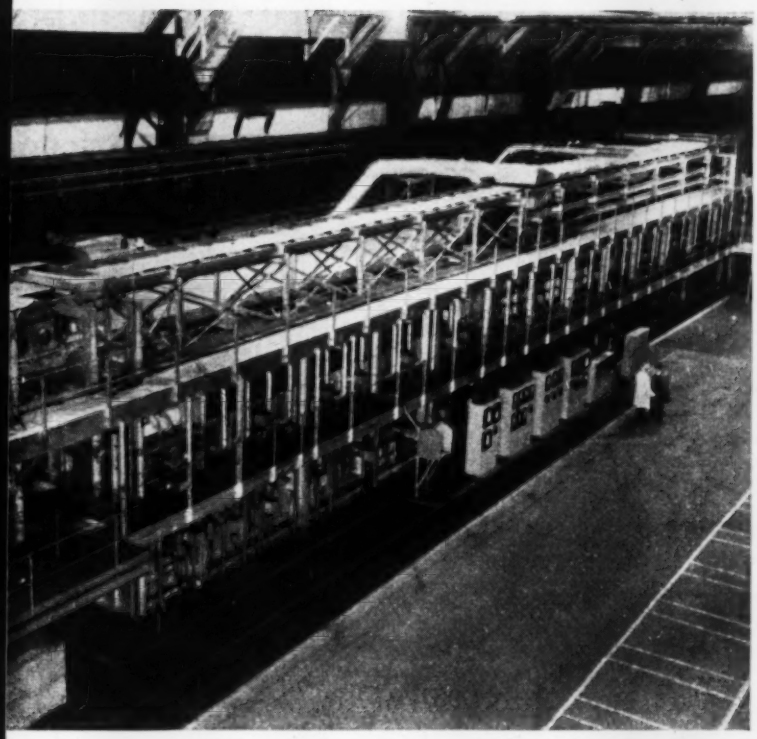
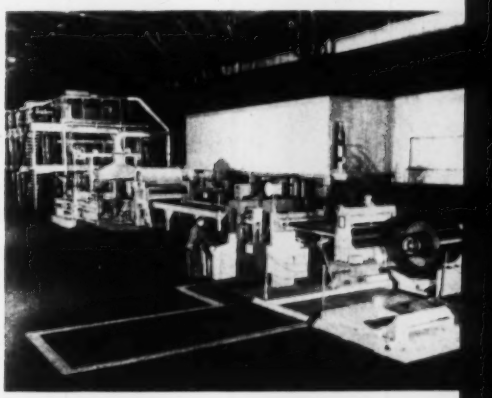
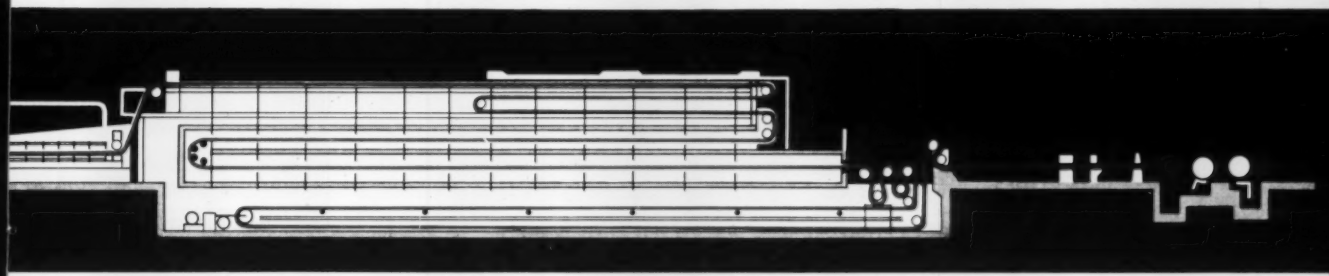


Rockwells in the low 40's are achieved consistently in this three-level normalizing furnace. Heating zone is on the lower furnace level; convection cooling in the middle; air blast cooling at the top. A horizontal "looper" is located underneath the furnace.



Payoff reel marks the entry of low carbon stock after cold rolling. Speeds of 150 fpm on 60" wide strip are attained.



This complete new Surface normalizing line for vitreous enamel stock started paying off on its first day of operation. For example, its capacity of 30,000 lbs. an hour puts this mill forcefully into the market for deep draw quality strip. More than adding new selling power, this big line increased productivity per operator by an almost unbelievable amount.

From payoff reel to real payoff, the entire installation is a graphic demonstration of Surface's qualifications as prime contractor. Applying its global experience in metallurgy, combustion, chemistry, and mechanization, Surface engineered and installed the complete line.

Take the opportunity now to evaluate the prime contracting skills available at Surface, and mobilize them for your profit, ***wherever heat is used in industry.***

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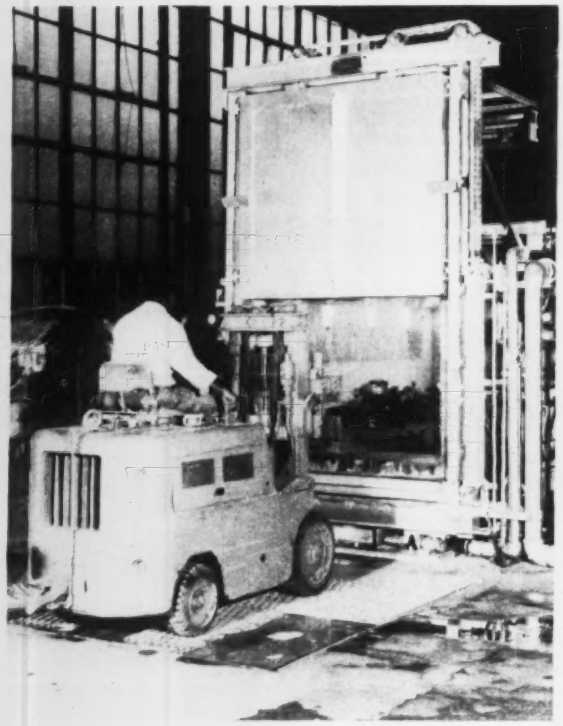
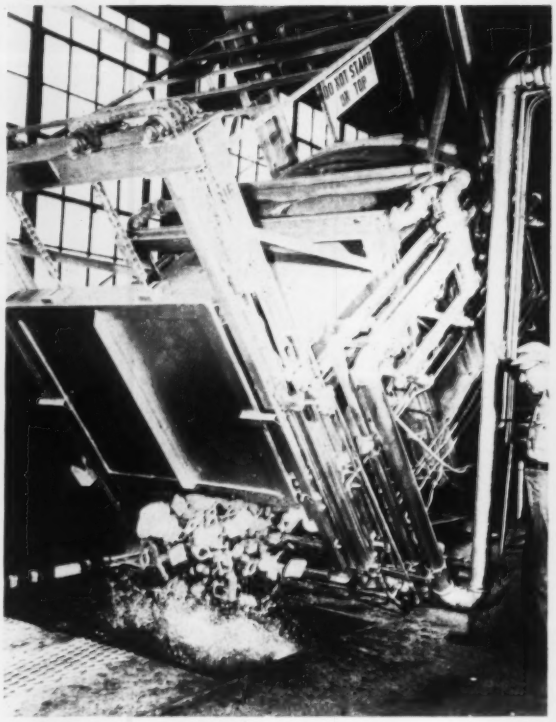
Tilting Furnace Improves Quench

IN . . .



OUT . . .



In handling chrome-nickel alloy castings, it's important to quench rapidly to develop maximum corrosion resistance. The unusual design of this unit reduces labor requirements, makes quality control easier

RAPID QUENCHING, essential for developing maximum corrosion resistance in the chrome-nickel stainless alloys, is obtained at the Duriron Co. Inc., Dayton, Ohio, with a novel tilting furnace. Basically a box unit, it tips as a whole to discharge castings which have been placed on the furnace hearth.

• **Fast Quench Important**—While the tilting feature means that the unloading of the furnace is a simple, one-man job, this was not the main reason for the unusual design. To obtain maximum corrosion resistance from the austenitic stainless steels, quenching must be rapid. A transfer time which might be satisfactory for heavy sections that hold their heat would be too long for light portions of the same casting. The size of the castings and the quantity produced would make unloading the furnace by manual methods difficult in the allowable time.

When parts are brought out of the furnace they start to cool, and the time needed to move the load to the quench might be excessive. Tipping the furnace insures that castings remain in the heating area, and at the correct temperature, until just before they enter the quench. Maintaining quality becomes an easier job. A suitable flexible discharge mechanism mounted inside the furnace would require alloy construction and be highly complex; keeping it in condition would be a continual headache.

• **How It's Done** — The furnace framework is mounted on trunnions at the front, and hydraulic cylinders are used to tilt the entire unit and to operate front and back access doors. Since this is a hot area (the furnace is designed to go to 2050° F), the liquid used is a fire resistant ethylene glycol solution—it contains about 35 per cent water to reduce fire hazards. Within 1 minute, the furnace can be tilted as much as 50 degrees from horizontal.

The designer, Surface Combustion Corp., Toledo, Ohio, has provided the furnace with special fittings so that it is not necessary to disconnect the air and gas lines when discharging. The main air and gas supplies have swivel couplings, while the pilot mixture line has flexible metallic hose to permit the motions. Flexible metallic hose is also

used in the hydraulic system which operates the doors.

• **Operating Cycle**—The doors on the front and back of the furnace are both used in the charging operation. The front door is opened first, and a fork truck equipped with a special manipulator distributes castings over the front of the hearth. The front door is closed, the rear one opened, and the same truck places the balance of the charge.

In front of the furnace, below floor level and covered with a metal plate hinged at the side, is the water quench tank. On completion of the heating cycle, the cover over the quench is removed, the furnace door is opened a small amount, and the furnace is tilted enough to cause the castings to slide into the quench at the right rate. Since the castings are inside the furnace until they fall into the quench, they do not have a chance to cool into a critical temperature zone.

Furnace atmosphere is determined by the products of combustion of the over-firing gas burners. The hearth, of ceramic material, is planned for the shifting load which it must carry; careful workmanship to insure tight fitting is essential.

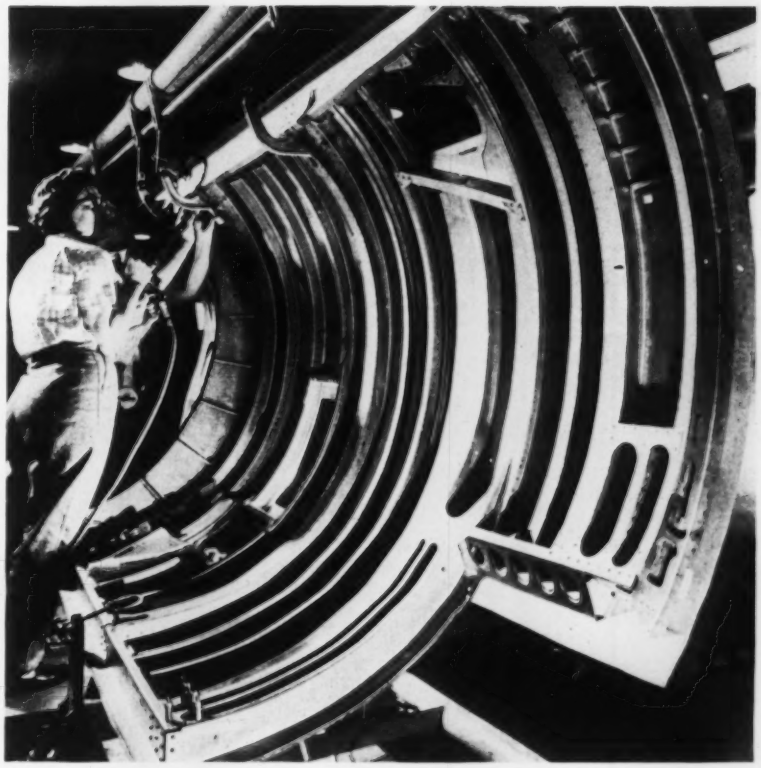
Not only is it easier to produce properly heat treated castings, but the furnace can be charged by one man. Two were required.

Crush Grinding Ups Plastic Part Output

IF you machine small cylindrical parts made of laminated plastic or vulcanized fiber, a tip from Taylor Fibre Co., Norristown, Pa., may help. Its production men have turned to crush form grinding, and they've boosted production rates by as much as 20 per cent.

The method is recommended when: 1. Finish tolerances are ±0.0005 in. or closer. 2. Parts are required in large enough quantities (generally 300,000 or more) to justify the initial cost of wheels. 3. Lathe bits might cause delamination of the plastic.

Grinding wheels are formed to the pattern of grooves, bevels, and other shapes that must go on the parts.



This titanium access panel is part of an engine pod. When installed, the unit swings up for engine servicing. Weight of the 76 x 102 in. door is 80 lb

Titanium in Airframe Puts More Payload in DC-8

The gain: Five extra passengers and their luggage on each of 5000 flights plane will make during its seven year writeoff period, or extra $525 in mail on each coast-to-coast trip

A HALF-TON GAIN in cargo capacity was realized by using a half ton of titanium in the airframe of the Douglas DC-8 Jetliner, reports United Airlines Inc., Chicago.

• **Use**—Bands made of high strength Ti-6A1-4V are riveted at 18 in. intervals on the circumference of the forward section of the fuselage in a failsafe pattern. They act as rip stoppers (prevent the propagation of cracks and resulting depressurization during flight).

Commercially pure (unalloyed) grade Ti-75A was used for engine pods—at a saving of about 500 lb. It resists short time temperatures up to 2000° F.

Sharply reduced machining and welding costs are claimed by the podmaker, Ryan Aeronautical Co., San Diego, Calif.

• **The Record**—Titanium components in 5800 aircraft engines have gone through a million flight hours without failure, says Pratt & Whitney Aircraft Div., United Aircraft Corp., East Hartford, Conn.

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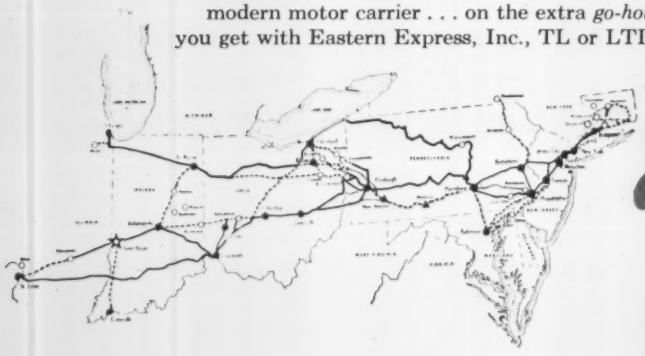

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Fabrication Problem Solved With Nylon Forming Tools

Mandrels for machine bending at the factory and protective shoes for hand bending in the field are made from stock shapes. Material requires minimum machining

USERS of prefinished aluminum extrusions and welded tubing are solving many of their forming problems with nylon tools made in stock shapes.

Bends made at the factory, or by licensees in the field, have been simplified with nylon mandrels and protective shoes by Lite Vent Industries Inc., Detroit, a producer of aluminum awnings. Nylon is supplied by the Polymer Corp., Reading, Pa.

• Factory tooling is designed for machine bending; hand benders are used in the field.

Each awning requires four bends, made on a 17 in. radius. The factory furnishes preformed sections in specified lengths, but licensees can form the material more economically in the field because shipping costs are lower for straight sections, and less scrap is produced.

Factory forming of curved sections requires mandrels to prevent buckling of prefinished material in bending machines. In the field, the finished exterior must be protected from scratching in hand benders.

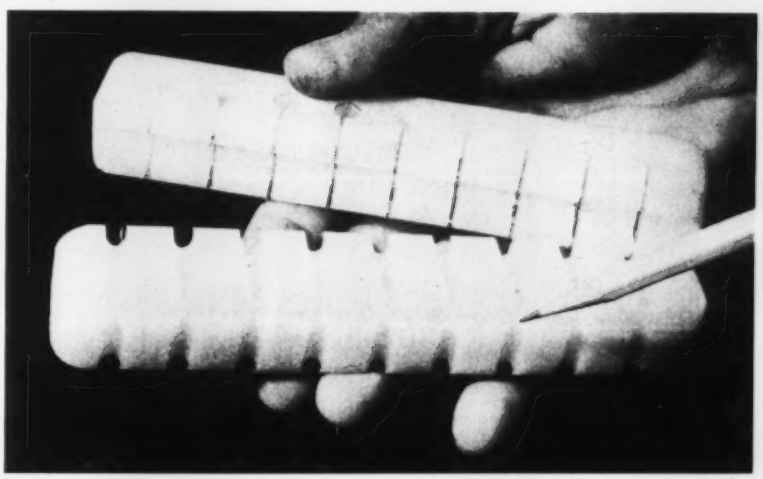
• Mandrels used at the factory must have high compressive strength. They must be smooth and flexible.

The mandrels are used to bend three tubes at a time in a machine. Tubes are slipped over the mandrels and clamped to the machine table. An air cylinder draws the forming roller and the mandrels around the bending plate. Mandrels slide smoothly, without galling, along the rough interior of the tubing. They keep it from crushing or buckling under the force of the forming roller.

Several types of mandrels are used. Grooves or slots, about ½ in. apart along the length of the nylon rod, increase flexibility. Grooves, cut in the sides of the rod, make the least flexible mandrel but are easy to machine. Narrow slots, cut in one side of the rod, produce a flexible tool, but holes must be drilled through the rod at the base of the slots to prevent notching. Longitudinal grooves are cut in both types for clearance of internal flash in welded tubing.

Other materials tried didn't do the job. Some took a permanent

Protective nylon shoe fits over prefinished aluminum extrusion and prevents damage to the finish during hand bending



Nylon mandrels, made from stock shapes, are stiff enough for easy insertion in welded tubing but flexible for use with powered bending equipment

set after they were used awhile.

• A protective nylon shoe prevents scratching in hand bends.

The nylon shoe is placed over the straight end of an aluminum extrusion. As the forming roller is pulled across the face of the bending plate, the shoe pivots on the plate. The shoe doesn't rub on the finished face of the extrusion; no marks are made on the satin or anodized gold finish.

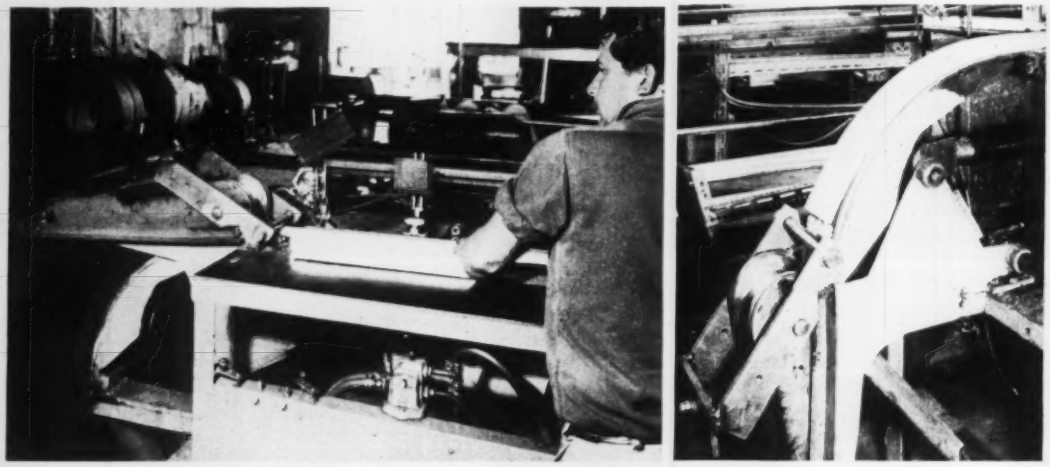
• Use of stock shapes cut material costs and holds down machining.

Tools are made of square nylon rods (mandrels from 1 in. rods, shoes from 1½ in. stock). Tolerance is +0.000 to −0.005 in.

No machining is done on rod surfaces, and little material is wasted. Two 6 in. mandrels are made from a 12 in. rod, and one field bending shoe is made from each 16 in. purchased length.

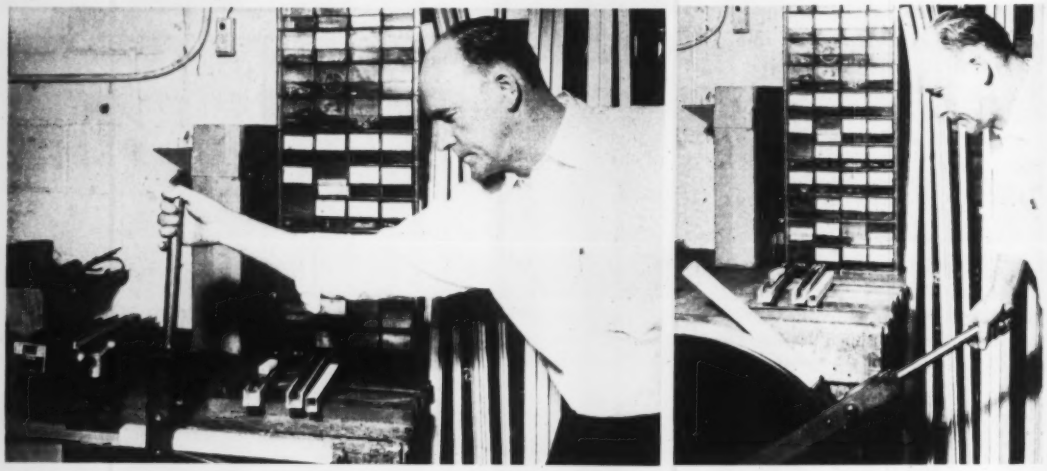
Standard milling equipment, with conventional cutters, is used to machine the nylon at high speeds and feeds. Burrs are removed with a sharp knife after milling, and sharp edges are rounded on a belt sander.

Flexible mandrels are used in machine bending at the factory . . .



Machine operator slides three straight lengths of tubing over nylon mandrels (left). Mandrels fit snugly in the tubing, but low friction of nylon minimizes drag. Forming roller (right) bends tube ends around a bending plate; mandrels prevent crushing

Nylon channel protects extrusions during hand bending in the field



Nylon shoe is placed over the end of an extrusion to protect it during hand bending (left). The forming roller is then pulled over the shoe (right). The shoe isn't flexible, but pivots around the point of contact as the forming roller passes

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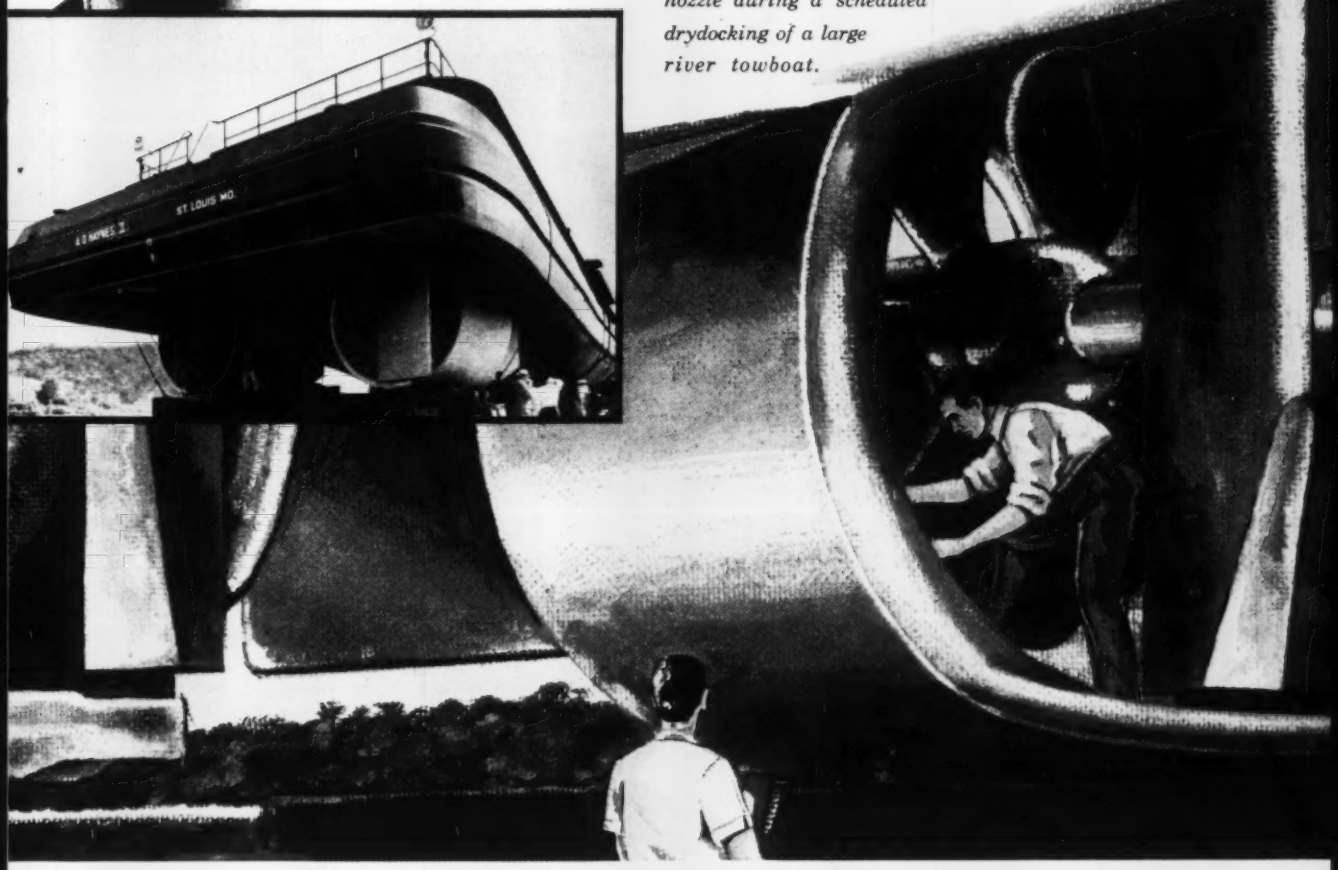

General Steel service engineers inspect a recently developed cast steel Kort nozzle during a scheduled drydocking of a large river towboat.

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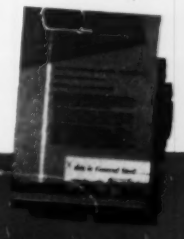

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Interstate Gets a Higher Quality Finish and Paint Mileage is More Than Doubled with

RANSBURG

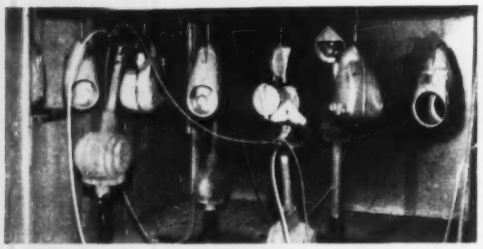
NO. 2 PROCESS ELECTROSTATIC SPRAY PAINTING

in finishing

COMPACT VACUUM CLEANERS

Interstate Engineering Corporation in Anaheim, Calif. switched from hand spray to Ransburg automatic Electro-Spray in the painting of their quality line of home renovating products: The COMPACT vacuum cleaner . . . the POLISH-AIRE floor polisher . . . and MAGIC DISC carpet and rug sweeper.

RESULTS? Quality of the painting improved, for with former hand spray, rejects used to run as high as 10%. That's because of Interstate's high quality standards. NOW, with Electro-Spray, rejects are cut to less than 2%! This alone would have justified the change, but Ransburg Electro-Spray also provides substantial labor and material savings. One operator now does the work of two. And, with the former method, Interstate was painting only 28 sets of parts per gallon of paint. Now, they get 57 sets of parts per gallon. Think of what 50% savings would mean in YOUR finishing department.



Vacuum cleaner parts are painted with wrinkle enamel as they pass through the electrostatic spray painting area in the finishing department at Interstate Engineering Corp. Unpainted parts, entering from the right, are coated uniformly by the two Ransburg atomizing bells on either side of the line.

NO REASON WHY YOU CAN'T DO IT, TOO!

Let us show YOU and test-prove the advantages of automatic electrostatic spray painting on YOUR products in our complete laboratories. Call or write for our No. 2 Process brochure which shows a variety of automatic painting installations on a wide variety of products in both large and small plants. Or, if your production doesn't justify automatic painting, let us tell you about the new No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

RANSBURG

RANSBURG

Electro-Coating Corp.

Box-23122, Indianapolis 23, Indiana

Alloy X Mold Wins in High Temperature Test

WHERE all other materials failed to complete even one successful firing cycle, press molds of Hastelloy Alloy X have passed the 70 cycle mark (280th hour) at 2200° F while under 9 tons of pressure at Gulton Industries Inc., Metuchen, N. J.

The operation involves the firing of a ceramic mass under a press that is exerting 18,000 lb pressure on the mold. The pressure is maintained for 4 hours while the mold glows white hot at a continuous 2200° F inside the furnace chamber.

All other high temperature materials tested failed due to the combined conditions of temperature, atmosphere, and pressure. The molds would oxidize, lose strength, dish severely, and otherwise fail during the cycle.

The products of the firing cycle, blocks of ceramic 36 sq in. in area, are destined for electronic equipment. Before, only blocks with an area of 1 sq in. were possible.

Gulton is using four firing presses for a two shift production. The molds consist of liners, a 6 by 6 in. cover plate, a 4 by 4 in. pressure plate, and a cylinder 2½ in. in diameter.

Haynes Stellite Co., a division of Union Carbide Corp., Kokomo, Ind., produces several Hastelloys.

New Creep Test Speedier

Creep testing of viscoelastic materials can be done faster and more accurately with a method developed for testing solid rocket fuel, says Stanford Research Institute, Menlo Park, Calif.

The method gives an accurate determination at the start of a test by using a strip chart recorder. A significant curve can be obtained in one day, says SRI.

The device can measure stress relaxation. The specimen is deformed mechanically at the time it is placed in the test machine. Stress decay is then measured and recorded automatically.

SRI designed the method for Wright Air Development Center, Dayton, Ohio. The measurement offers important information about the physical and chemical behavior of rocket propellents.

Machine Can Be Programed for Assembly Operations

ELECTRONIC control is provided by this unit, designed to handle many tasks involved in part handling, assembling, and machine operations. It can perform these jobs in any desired sequence.

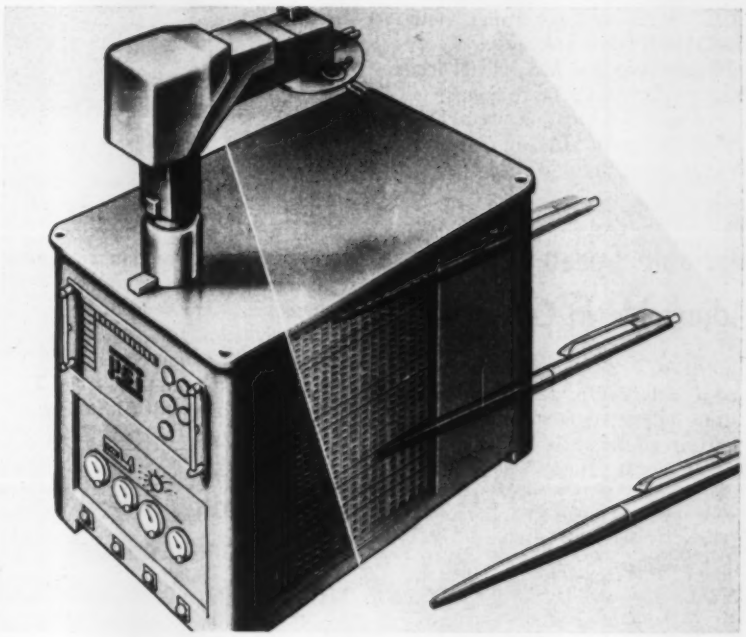
Setups and programing on a panel in the base of the unit (called TransfeRobot) take only about 30 minutes.

Once it has been set up for an operation, it will continue until reassigned.

The equipment is able to handle many types of work efficiently with existing equipment. Suggested assembly applications: Guided missiles, toys, carburetors, typewriters, lighters and pens (see cut).

Floor space requirements are about 6 sq ft.

For more information, *write* USI Robodyne Div., U. S. Industries Inc., Silver Spring, Md.



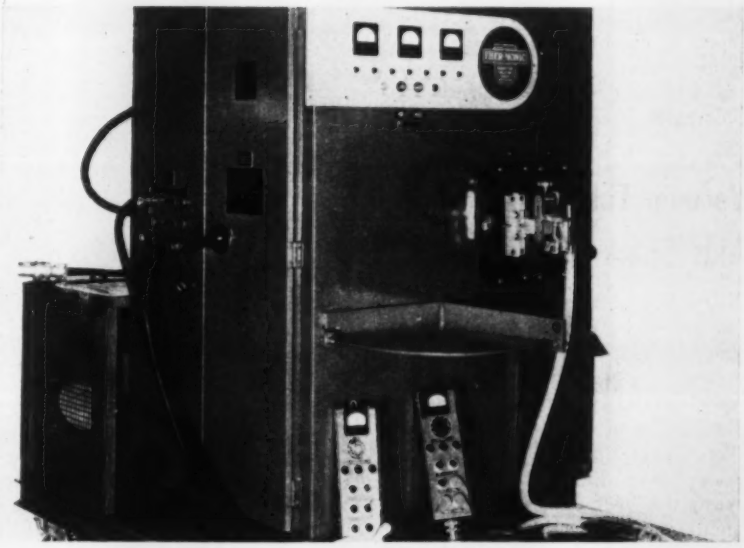
Dual Output Induction Heater Is Portable

MANEUVERABILITY is a feature of this remotely operated, dual output induction heater. It has no water connection. Being portable, it can be taken to large or cumbersome workpieces.

The first units were designed for aircraft manufacturers for brazing (examples: Fuel and hydraulic lines).

The equipment comes as a package (dual output station and controls for accessory equipment and pendant remote stations are included). Two flexible, low loss, high frequency cables furnish power to two work coils. They can be up to 50 ft long.

Only the input power cable must be disconnected before the unit is moved. The equipment is shock



mounted on a platform and can be towed up to 15 mph.

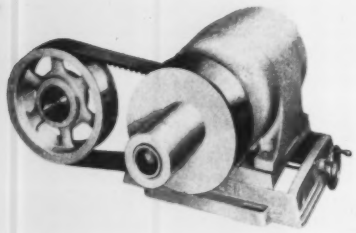
Electrical interlocks on each coil prevent simultaneous operation. An indicator light shows which coil is in use.

The heater is self-contained even to water cooling. Of the C series electronic type, it is certified to meet FCC regulations governing radiation. Use of low voltage work coils and grounded low loss coaxial leads insure safety, says the company.

For more information, *write* Dept. PR-5, Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.

Variable Speed Drives Adjustable in Operation

COMPACT 20 and 25 hp variable speed drives are designed for accurate adjustments while in operation. Speed range is 3:1. The units have Class II ratings.



Different types of controlling devices are available. A selection of companion sheaves gives a wide choice of operating speeds.

For more information, *write* Lewellen Mfg. Co., 1410 Tenth St., Columbus, Ind.

Vacuum Tube Power Unit Aids Spark Machining

HERE'S a series of power supplies for electrical discharge machines that can help you raise production and quality. Machining rates are increased six times over those of previous models and finishes are three times finer. The units produce better finishes at roughing rates, use plug-in units for easier maintenance, and have 75 per cent

fewer tubes. Initial and operating costs are lower, says the manufacturer.

The units can be sectionalized into split output sections for multiple electrode operation. A 100 ampere unit can be split into four 25 ampere sections. Sizes range from 15 to 1000 amperes.

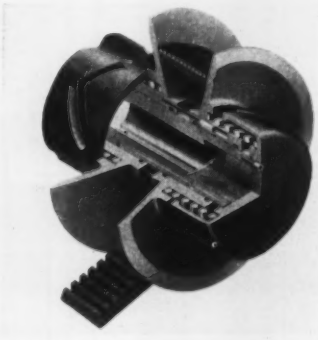
For more information, *write* Elox Corp. of Michigan, 1830 Stephenson Highway, Troy, Mich.

Sheave Holds Speed During Load Changes

THIS variable speed sheave is designed to hold a constant driven speed during changing torque loads. Sticking during speed changes is eliminated, says the company. Lubrication maintenance has been reduced to checking the oil reservoir once or twice a year.

Cam pressure is exerted only when the load requires it. Power is transmitted equally to both movable flanges through a series of torsionally resilient rubber cam followers.

Sidewall pressure on the belt varies in proportion to the torque required to carry the load. Since the grip on the belt increases as the load increases, pitch diameter is maintained and driven speed is kept constant regardless of torque conditions, says the manufacturer.

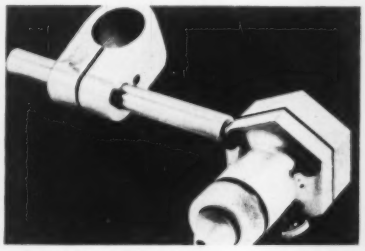


For more information, *write* T. B. Wood's Sons Co., 1200 Fifth Ave., Chambersburg, Pa.

Adjustable Nozzle Pares Care Problems

EASY, FAST, and economical maintenance is designed into this adjustable discharge atomizing nozzle for spraying die lubricants, adhesives, and other liquid coatings. The unit operates at pressures from 1 to 100 psi.

A simple adjustment controls flow, size, and shape of spray pattern. Positive shutoff at the nozzle



orifice insures no drip operation. Manifold type air and liquid connections allow the nozzle assembly to be removed without disturbing nozzle mounting or hose lines.

A mounting bracket is available to simplify installation where the nozzle can be set in a fixed position.

For more information, *write* Columbus Automatic Lubrication Co., 81 E. State St., Columbus 15, Ohio.

Automatic Control Unit Handles Battery Chargers

YOU can prolong high capacity working life of industrial batteries. One way to do it is with the MP-3 (Exide) charge control unit. The device is designed to automatically regulate charging equipment (constant potential charging).

Both daily charging and weekly equalizing charges can be handled. Dialing the timing switch control indicator starts the process.

A control unit is provided to op-

SECO's experienced staff of trained engineers . . . men highly skilled in design and execution . . . are available to assist you in solving all problems

Predictable Performance

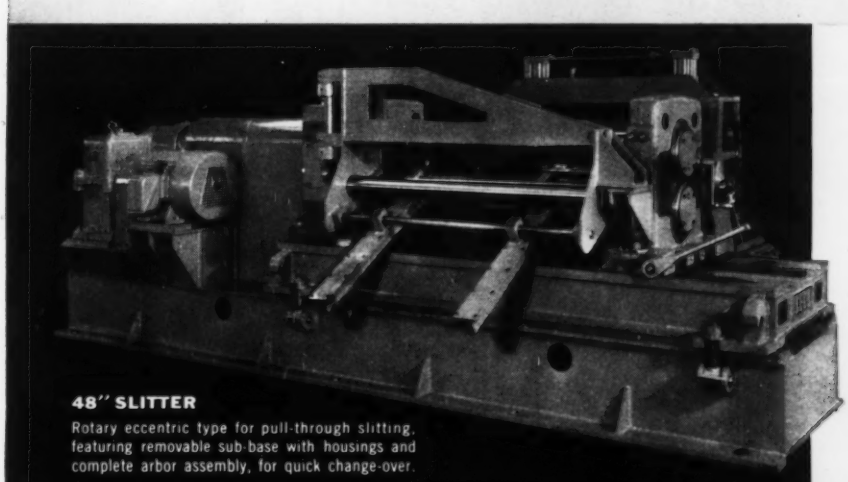
you may be experiencing through the use of ordinary Steel Slitting Equipment.

These specialists are at your service to eliminate production (and profit) bottlenecks that are unique to your particular operation and can recommend and design a Custom-Built Slitter to your exact specifications, meeting all your production requirements, with predictable performance. Call or write TODAY.

is yours when you change to

SECO

Slitting Lines



48" SLITTER
Rotary eccentric type for pull-through slitting, featuring removable sub-base with housings and complete arbor assembly, for quick change-over.

SECO Steel Mill Equipment

- Leveling and Shearing Lines
- Combination Edging and Flattening Lines
- Tension Reels for Strip Polishers
- Narrow Strip Grinding Machines
- Multiple Strand Pull-out Rolls and Take-up Frames
- Strip Coilers (Up and Down Type)
- Traverse Reels for Narrow Strip
- Steel Coil Up-enders
- Scrap Ballers

SECO

STEEL EQUIPMENT CO.

Affiliated with Lee Wilson Engineering Co., Inc.

HARPER®

Extruding Corrosion-Resistant Metals at the H. M. Harper Co. Metals Division

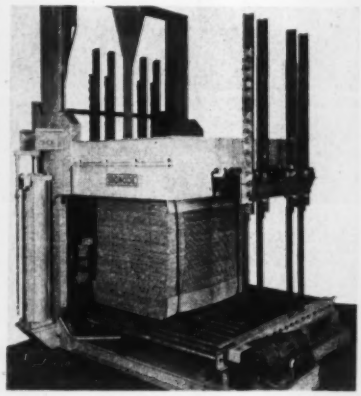
erate an external auxiliary relay when two-rate charging is desired; you can get such units for 6 to 60 cells.

For more information, *write* Exide Industrial Div., Electric Storage Battery Co., Rising Sun and Adams Avenues, Philadelphia 20, Pa.

Strapping Machine Features Faster Operation

A SERIES of compression strapping machines is designed to simplify, speed up, and help make steel strapping operations automatic.

The machines (Series CSM) compress the load, then feed, tension, and automatically seal the strap in seconds. The finished bale stacks easily and occupies little space in shipment and storage.



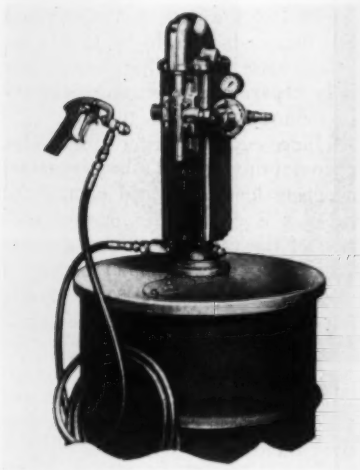
Compression strapping machines can be ordered with platen pressures from 6000 to 16,000 lb. Either pneumatic or hydraulic systems are available.

For more information, *write* Signode Steel Strapping Co., 2600 North Western Ave., Chicago 47, Ill.

Spray Painting System Needs No Atomizing Air

HYDRAULIC PRESSURE atomizes the paint in the No-Air Dyna-Spray System. No atomizing air is required.

Advantages: No heating of the material is necessary and a smaller



compressor can be used, says the company. Overspray and bounce-back are reduced. Less material gets into the atmosphere and ventilation problems are generally eliminated.

Four different nozzles provide a variety of spray angles from 15 to 80 degrees. The heavy duty gun weighs 12 ounces and can be locked in open position for continuous spraying. A pulsation-free spray pattern is produced at pressures ranging from 400 to 2000 psi.

For more information, *write* Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

Power Pipe Machine Handles Pipe, Bolts

PIPE through 2 in. can be threaded, cut, and reamed by the Toledo power pipe machine (No. 98). The unit can also thread ¼ to 1½ in. bolts.

Special features: The die head, cutoff tool, and reamer can be used

HARPER®

Corrosion-resistance starts here

What CORROSION-RESISTANT Fastenings Do You Need?

Harper has manufactured fastenings in more than 100 different corrosion-resistant alloys . . . Stainless Steels, Monel, Silicon Bronze, Naval Bronze, Brass, Aluminum, Titanium.

What STANDARD Type and Size Do You Need?

From #2 screw size through diameters of 2 inches, Harper maintains the broadest standard product line in its industry . . . and Harper Distributors are everywhere. See your Yellow Pages.

What SPECIAL Type Fastenings Do You Need?

Cold Heading and Hot Heading techniques are a science at Harper. Both "know-how" and facilities are directed toward cost-reduction and quality improvement on your parts of non-standard size and shape.

What EXTRA Benefits Does Harper Give YOU?

- You have assured supply because Harper produces its own raw metal.
- You receive immediate deliveries from local stocks.
- You gain customer goodwill for your products through Harper quality.
- You lower your costs by efficiencies in purchasing, maintenance and assembly.

Attach to your letterhead

FOR COMPLETE REPORT

Sales Material Department
THE H. M. HARPER COMPANY
8200 Lehigh Avenue
Morton Grove, Illinois

Gentlemen: Send me a copy of the new Harper "Corrosion Guide" at no cost or obligation.

THE H. M. HARPER COMPANY
8200 LEHIGH AVENUE • MORTON GROVE, ILLINOIS

as close as ¾ in. from the chuck. An offset roller cutter provides maximum visibility and more accurate cutoff. The 10 in. minimum carriage travel betters federal specifications by at least 2 in., says the company. The chuck, centering device, and gear train are interchangeable with other Toledo power machines.

Either cam type or quick opening die heads are supplied with the model. The cam type is mounted directly on the carriage. An adapter plate is used in mounting the quick opening type.

For more information, *write* Toledo Pipe Threading Machine Co., 1445 Summit Ave., Toledo, Ohio.

Traverse Cutting Machine Has Automatic Elevation

A TRAVERSE type metal cutting machine features power raising and lowering of rails to quickly obtain correct wheel arc of contact for any thickness of sheet and plate stock.

Rails on the machine (Model SS-100-LR) are instantly adjustable from 2¼ to 7¼ in. above the table top. Precision adjustments are then possible by independently raising or lowering the cutting head from the control panel.

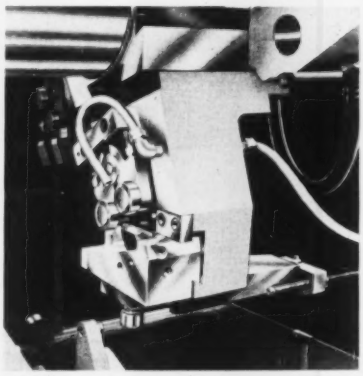
Flexible vertical positioning provides maximum wheel efficiency, increased wheel life, and faster positioning for step and repeat cuts. Automatic elevation also eases positioning of new stock and removal of finished material. Control of the entire cutting cycle is centered in the pushbutton panel. Cycle controls include start, stop, forward, reverse, rate of feed, and elevation of head and rails.

Air clamps (exerting 535 psi) hold the stock in position on the reinforced steel base. A standard 12 in. blade is used. The unit can cut a 3 in. aluminum alloy plate at 18 in. per minute to close tolerances, says the company. A 10 hp continuous duty, geared in head motor is used. Ferrous and nonferrous sheet or plate stock can also be cut.

For more information, *write* Stone Machinery Co., Manlius, N. Y.

Bar Turner Tolerance, Finishes Improved

CLOSE tolerances and smooth finishes can be obtained with a Warner & Swasey retractable cutter bar turner that features highly efficient



metal removal. It's designed for the company's 2AB single spindle bar automatic.

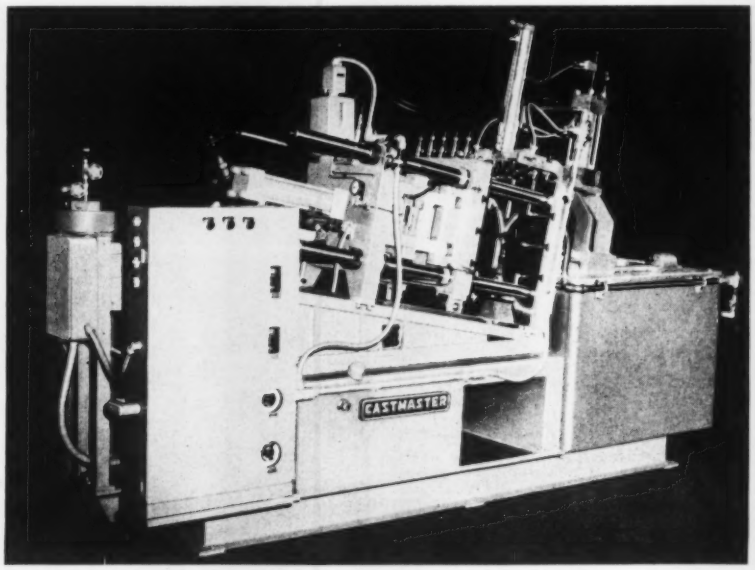
Automatic cutter retraction and resetting eliminates tool withdrawal marks and prolongs cutter life, says the company.

The turner clamps directly in the dovetail of the pentagon turret and can handle bars from ½ to 2¾ in. in diameter. A cooling line is the only separate connection necessary in mounting the bar turner.

Under cut, the turner's toolholder slide (spring loaded) bears against a spring loaded stepped cam. After the cut is completed, forward motion of the cam stops when a screw (connected to the cam) strikes a stop on the front cross slide housing of the machine. The pentagon turret then continues to feed forward about ⅛ in. to the end of its stroke, removing the turner's tool slide from the cam and retracting the cutter.

Cam and cutter are automatically reset in an off-index position by an overhead mounted resetting cam. The resetting cam bears on a roller located on the bottom of the cutter slide.

For more information, *write* Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

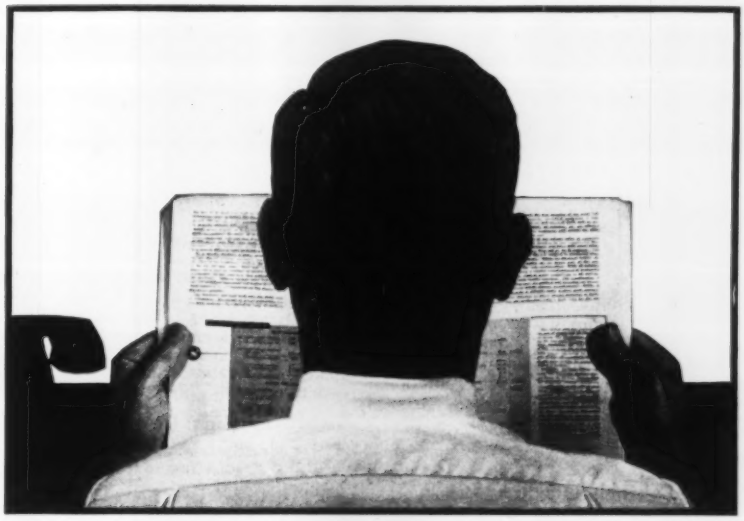


Diecaster Operates at High Speed

EXTREMELY fast production—up to 1000 shots an hour—of small zinc castings is possible with the Model 7Z, 100-ton hot chamber diecasting machine.

The machine features inclined plates and injection cylinder to keep nozzle drippings to a minimum and to permit castings to fall freely. Plates are 21½ x 21½ in.; space

$1000 REWARD



For the capture of this man's ATTENTION

This is the opportunity you've been looking for—a chance to create a really effective businesspaper advertisement.

YOU CAN EARN $1000

To satisfy this long-time, deep-felt urge—and earn $1000 in the bargain—send us copy and a rough layout for *one* advertisement (any size, color or not, as you see fit). This ad should be capable of attracting the interested attention of industrial advertisers with a stake in the automation market. It should point up the values AUTOMATION magazine holds as a medium for reaching buyers of automatic production equipment.

MORE THAN ONE WINNER

This is not a one-winner contest. AUTOMATION will pay $1000 to the creator of each advertisement it decides subsequently to use as part of its advertising campaign. AUTOMATION editors will be the judges. Contestant's identity will remain anonymous during the judging.

FOR HELPFUL BACKGROUND INFORMATION

Pertinent information about AUTOMATION's market, readers and objectives for use in preparing your entry appears on the back of this page. If you desire additional material, please write and we will send you a booklet supplying complete details.

DEADLINE IS NOVEMBER 30, 1959

The competition is open to all. Anyone with a creative flair is urged to try his skill. Yours may be just the idea we're looking for. Send completed entries to $1000 Reward, c/o AUTOMATION, Penton Building, Cleveland 13, Ohio.

Background Information to Help You Win

$1000 REWARD

(For complete contest details, please see reverse side)

The Marketing Man's Stake in Automation

Automation is the marketing man's challenge today—and in the future. His ideas *must* match this manufacturing concept. The creative marketer realizes that as an absolute first condition, automation requires the establishment of a predictable, stable, and expanding market. Economic and sociological pressures force automation on us; automation forces new marketing concepts on us.

The building of a constant market will require a more complete circuit of communication. Now, the manufacturer-customer flow of information largely goes from the maker to the buyer. But with automation, we will have to know more about what the customer wants. Needed are improved ways to get better communication from maker to user and then back again.

The Management Man's Stake

Automation, or continuous automatic production, naturally will grow out of more complete mechanization. We have progressed from the manual area through the mechanization area and are now well into automation. Any discussion about whether automation is desirable is a futile intellectual exercise. We might as well argue whether the tides and the seasons are desirable.

The dawn of mechanization at the turn of the century brought a new era of lower costs and a higher standard of living than would have been possible in a manually operated economy. Now, we are approaching the upper limits of cost and labor reduction possibilities in a mechanically operated economy. We need a new breakthrough—and it will come through automation.

In the words of D. S. Harder, former Executive Vice President, Basic Manufacturing Divisions, Ford Motor Co.

> "Time has proved that the machine age is a boon—not a bugaboo . . . Manufacturers, large and small, have to make a choice. They can heed the warnings of uninformed doom prophets and retard our industrial progress—a road leading to oblivion. Or we can all have faith in ourselves and our ability to harness the potential of this new phase of industrialization for the benefit of all."

The Manufacturing Engineering Function

When industry first backed into automation without precision engineering, it had plenty of trouble. As a result, the manufacturing engineering function developed and has become industry's fastest growing and most important buying influence for automated production equipment.

Industry is changing from a departmentalized approach to a three-phase approach.

PHASE ONE—the processing or work-performing phase, which includes all the steps that alter or combine materials.

Phase Two—the handling phase, which encompasses the movement of materials in process within or between machines.

Phase Three—the control phase, covering the automatic cycling of functions 1 and 2—either independently or integrated.

How AUTOMATION Serves This Function

Edited for men with *manufacturing engineering* interests and responsibilities . . . AUTOMATION serves all industries. It reports and interprets all significant advancements and trends relating to automation, including planning, development, design, installation and maintenance. It provides for the exchange of ideas from one industry to another. This cross fertilization is the time-and-money saving link between those who have solved a production process problem and those who are still looking for a solution.

Why Users Read AUTOMATION

AUTOMATION is directed particularly to manufacturing engineering and operating management men in industry who are responsible for, or directly interested in, automation. Editorial and advertising pages provide the basis for their decisions concerning the adoption or improvement of automated equipment and manufacturing systems for their own use.

Why Designers and Builders Read It

In addition, AUTOMATION appeals to engineers and management men in companies that serve the special automation needs of industry . . . the manufacturing engineering function *to* industry. It gives designers and builders specific job help relating to all types of automated original production equipment . . . from single automatic machines to fully integrated lines and plants.

Reaches a $5 Billion Market

A continuing industry-wide study pinpoints the tremendous potential for Production Equipment, Handling Equipment, Power Drives and Automatic Control Equipment in this vast market controlled by the manufacturing engineering function. This "Survey Report and Automation Forecast" provides you with a new measure of marketing trends. Ask your AUTOMATION Representative to show you how to incorporate its data into *your* marketing plans.

Attracts a 90,000 Buyer Audience

AUTOMATION's vital readership is concentrated among 90,000 key buying influences . . . the manufacturing engineering and management men who specify, recommend, approve and buy your products. It reaches the important influences of the buying team . . . the men your salesmen don't always get a chance to contact and, yet, would *prefer* to contact.

High Response to Editorial

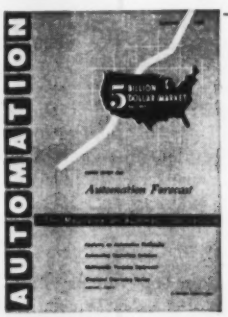
Written by manufacturing engineers for manufacturing engineers . . . AUTOMATION is geared to the exact needs and wants of its readers. Its editorial pages clearly communicate—create respect and response! This high level of reader interest is documented by reprint requests (averaging over 130,000 annually) and continually high Starch readership scores.

High Response to Advertising

Every advertisement in AUTOMATION is directed to the manufacturing engineering function, production-management men, or the designers of production equipment. No waste circulation . . . for every reader has the *need* to know about these products and the *power* to buy them.

Market Planning Help

You get more effective results from your advertising and help in reaching key automation-minded men in industry, too, with a complete marketing plan which includes: The Penton Census . . . the Continuing Industry-Wide Study of Automation . . . Reader Action Reports . . . Market Data Sheets . . . Starch Scores . . . plus many other Merchandising Aids. Your AUTOMATION Representative is prepared to help you make the most of industry's fastest growing and most influential function—*manufacturing engineering.*



Get ACTION from the men who buy and specify . . .

- *Production Equipment*
- *Handling Equipment*
- *Power Drives and Automatic Control Equipment*

AUTOMATION

A Penton Publication
Penton Bldg., Cleveland 13, Ohio

between tiebars is 13½ x 13½ in.; maximum die stroke is 8 in.; injector cylinder stroke is 6½ in.

For more information, *write* Cast-Master, H-P-M Div., Koehring Co., 23901 Aurora Rd., Bedford, Ohio.

Barrel Finishing Media Cuts Lodgement Problems

PREDOMINANTLY cubical shapes of Techline Type Q quartz barrel finishing media help reduce lodgement problems in finishing intricate shapes, claims the company.

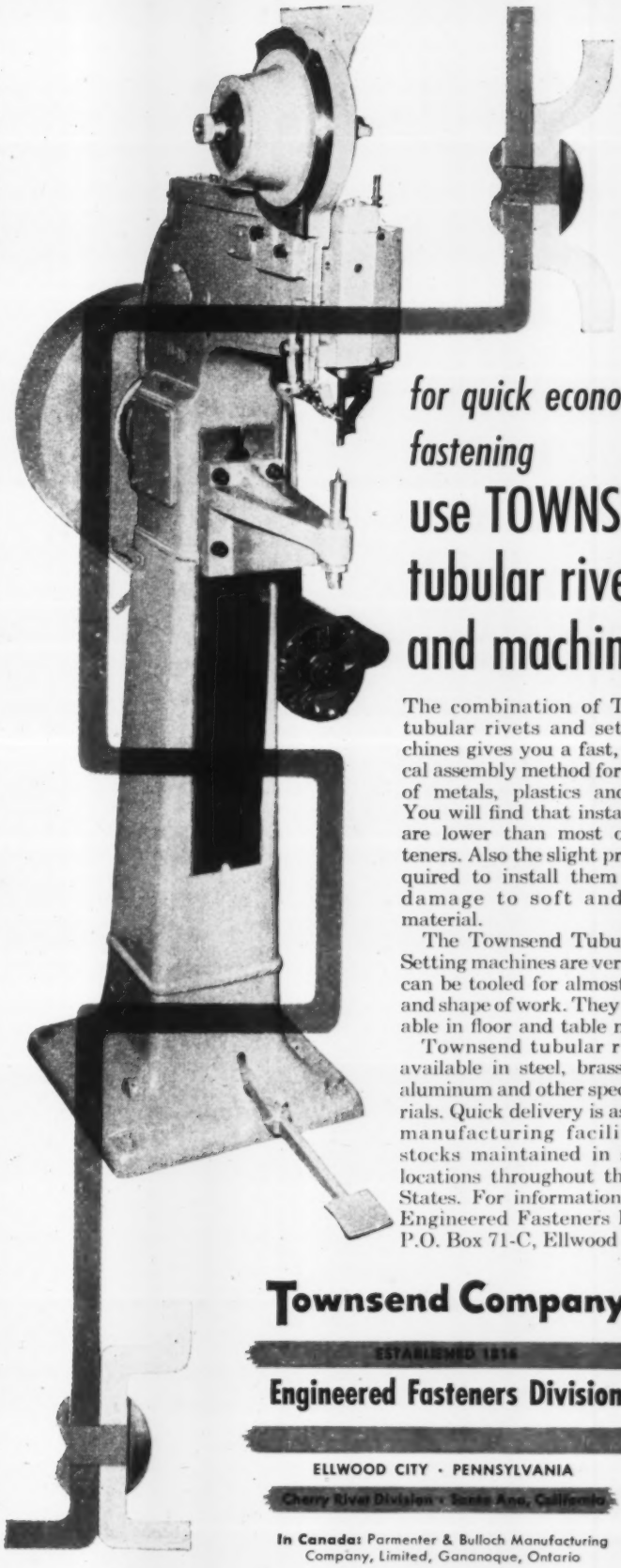
The pink colored material is harder, has a finer texture, and can be used in burnishing due to its surface smoothness. The natural medium is available in a range of sizes from 00 through 6.

For more information, *write* Techline Div., Wheelabrator Corp., 1157 Avenue V, Vicksburg, Mich.

Welding Flux Grinder Saves, Pays Own Way

THIS submerged melt welding flux grinder (Model RG-1) will return its initial cost after 12,000 lb of flux has been reclaimed, says the manufacturer.

The unit can process over 1500 lb of fused flux per hour. It has a



for quick economical fastening

use TOWNSEND tubular rivets and machines

The combination of Townsend tubular rivets and setting machines gives you a fast, economical assembly method for a variety of metals, plastics and fabrics. You will find that installed costs are lower than most other fasteners. Also the slight pressure required to install them prevents damage to soft and fragile material.

The Townsend Tubular Rivet Setting machines are versatile and can be tooled for almost any size and shape of work. They are available in floor and table models.

Townsend tubular rivets are available in steel, brass, copper, aluminum and other special materials. Quick delivery is assured by manufacturing facilities and stocks maintained in strategic locations throughout the United States. For information write to Engineered Fasteners Division, P.O. Box 71-C, Ellwood City, Pa.

Townsend Company

ESTABLISHED 1854

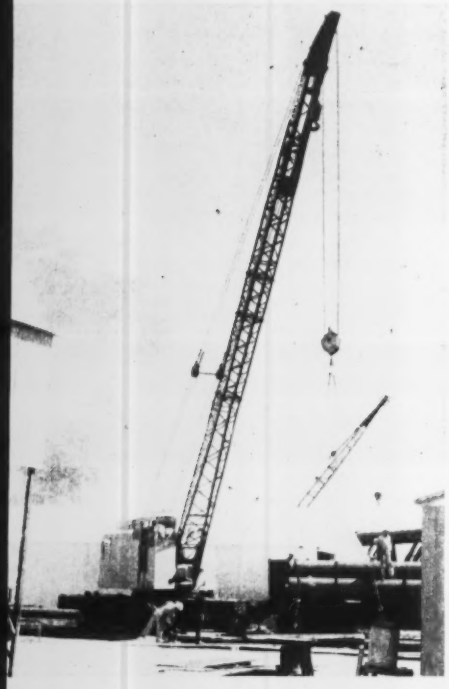
Engineered Fasteners Division

ELLWOOD CITY · PENNSYLVANIA

Cherry Rivet Division · Santa Ana, California

In Canada: Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario

VERSATILE PLANT DUTIES: Sorting, loading, fabricating, erecting—this 300 series self-propelled crane (above) performs all kinds of jobs that demand precise load control. Left: An American DiesELectric Crane performs the dual work of loading and switching rail cars.



ON RAIL, ON GROUND—AMERICAN CRANES PRODUCE FAST, POWERFUL MATERIALS HANDLING SERVICE

Looking for the most efficient answer to your heavy-duty lifting and loading demands? Here it is: American Cranes, either on rail, rubber, or crawler. American Truck, Self-propelled and Crawler Cranes . . . capacities from 12½ to 60 tons . . . will meet all your requirements for mobility and speed. Moving easily in tight spots, or down narrow aisles with big loads, American Cranes were designed for *all* the tough jobs. Combined with any front, crane or excavator, they give you top performance on every move.

American DiesELectric* Locomotive Cranes, with capacities to 130 tons, that swing, travel, hoist, and raise or lower its boom (all at the same time, if necessary) will give you the ultimate in fast, efficient pin-point spotting. Detailed operating records show that American DiesELectric* Cranes can write off . . . work off . . . their initial cost in a few years. American Cranes are outstanding . . . just ask any owner. Or write us for detailed and illustrated information on American equipment that has served industry for more than three-quarters of a century.

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AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

magnetic separator and hard surfaced roll crushers. Both crushers are powerized, adjustable spring loaded types. Air blower systems suppress dust. Floor space requirements are low.

Rehandling is eliminated by continuous circulation. A totally enclosed 3 hp motor is used. The unit has heavy duty sealed roller bearings.

For further information, *write* I. & B Welding Equipment Inc., 2424 Sixth St., Berkeley, Calif.

Spring Loaded Bottom Lifts Hand Truck Contents

A FLOATING bottom available in Kennett hand trucks is designed to continually keep contents at waist level to reduce worker fatigue and likelihood of personal injuries.

A floating, spring loaded hardwood bottom is supported by heavy duty torsion springs. The weight of the contents controls up and down movement.

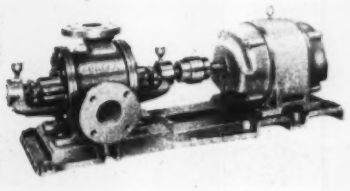
Steel guide arms in a pantagraph arrangement keep the bottom level and in constant alignment. Weight distribution has no effect on alignment, says the company.

The trucks are available for handling loads up to 450 lb. You can get different standard truck lengths, widths, and strokes.

For more information, *write* National Vulcanized Fibre Co., 1059 Beech St., Wilmington 99, Del.

Turbine Type Pumps Have Balanced Radial Loads

REVISED shell housing on the Apco two stage, turbine type pumps balances radial loads and eliminates shaft deflection, says the company. That is done by directing the fluid



NEWS
from Torrington on
SMALL PRECISION METAL PARTS

"Custom manufacture" has many meanings to the Specialties engineers here at Torrington. One of our customers, for example, may require a part having fairly wide tolerances of several thousandths. The very next job on an engineer's desk may present a real challenge, calling for a complex series of manufacturing operations and a precision measured in ten-thousandths. Torrington's unmatched experience, engineering skills and facilities are ready to serve you *whatever* your particular requirements might be.

A comparatively simple job now going through calls for train axles for HO gage model equipment. The length tolerance is held to .010" and the diameter tolerance is .002". Our engineers complete the whole operation on super high-speed blanking machines designed by Torrington which operate at much greater speeds than available with other commercial equipment. Result . . . substantial savings on a low-cost, high-volume item for our customer.

In contrast to this, a current contract with one of America's leading clockmakers calls for a balance shaft with a diameter tolerance of .0005". If the shaft is supported at the points and rotated, the OD must rise and fall a maximum of .0015" during one revolution. Specialties engineers meet these more demanding specifications with a machine that will cut, form and mill in a single high-speed operation perfected by Torrington. Usual expensive burnishing is replaced by a much faster and far less expensive method to produce a fine finish. Result . . . another example of our ability to adopt new methods in solving a customer's problem economically.

A special engineering department is maintained by the Specialties Division to help you solve any problems involving small metal parts. If required, our highly experienced and skilled engineers will help you design the part for most efficient and economical production. More and more manufacturers are turning to specialized Torrington service. If small precision metal parts are *your* problem, just circle our number on the reply card, call our area salesman, or write direct to:

The Torrington Company, Specialties Division, 900 Field Street, Torrington, Conn.

TORRINGTON SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

from the first to the second stage impeller in a 180 degree crossover.

Removable channel rings provide easier and inexpensive replacement of eroded or corroded surfaces, claims the maker. The lack of metal to metal contact within the pump channel permits handling of free flowing or nonlubricating liquids with reduced wear.

Two stage hydraulic balance is maintained with each of the multivane impellers operating with double suction. The impellers handle vapor and air along with the liquid to eliminate vapor lock within the pump.

Capacities within Series 4, 5, and 6 can be increased or decreased by changing the channel rings and impeller. Conversion to righthand or lefthand operation can be done in the field without special parts. Pump capacities go up to 150 gpm and pressures up to 300 psi.

For more information, *write* Aurora Pump Div., New York Air Brake Co., Loucks Street, Aurora, Ill.

Torque Safety Control Featured by Air Grinder

INCREASE in air power of 100 per cent and positive safety controls are featured in the Thor line of 6 in. capacity straight air grinders.

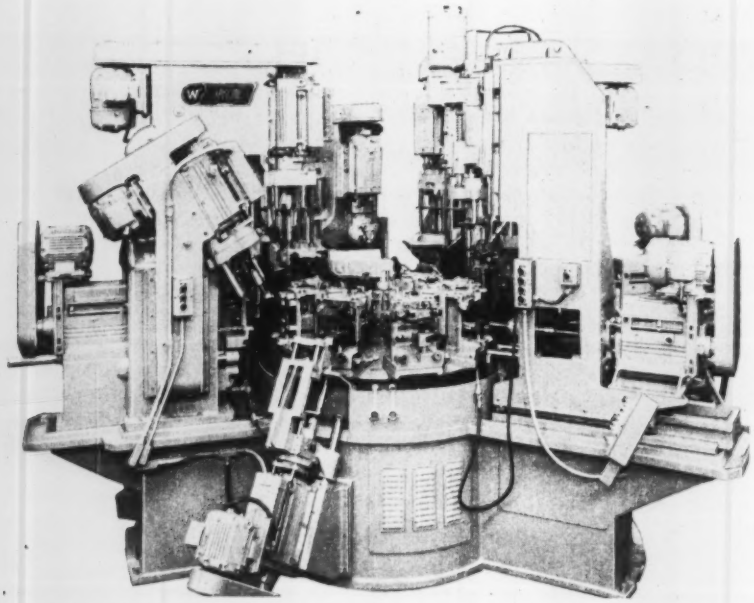
The units remain in the 10 lb weight class and are only 2 lb heavier when geared down to wire brush speeds, says the manufacturer.

More features: Exhaust noise is reduced 50 per cent. Motor housings are insulated inside a double wall. That also cools the motor for better operating characteristics and eliminates exhaust port freezing. Throttle variations are available.

Positive safety control is provided by an overspeed control (integral with the standard governor). The device automatically cuts the air supply to the motor whenever a governor failure or other condition causes overspeeding.

Grinders in the No. 5 series are furnished at speeds of 4500 or 6000 rpm. Special gearing sets the wire brush model at 2000 rpm.

For more information, *write* Thor Power Tool Co., 175 N. State St., Aurora, Ill.



NINETEEN SEPARATE OPERATIONS on forged steel connecting rods for outboard motors are performed in this Wisconsin special eight station machine. A series of four duplicate machines, all having interchangeable tooling, enables the manufacturer to process 10, 18, 25, 35, and 50 horsepower connecting rods. Fixture permits sides and ends of the connecting rod to be machined simultaneously. Fixtures are clamped and unclamped automatically. For more information, **write** Wisconsin Drill Head Co., Butler, Wis.

NEW Literature

Write directly to the company for a copy

Metal Cleaning Handbook

A 28 page handbook discusses the chemistry and techniques of: Tank cleaning (with suggestions for tank design and layout and selection of detergents), electrocleaning, barrel cleaning, machine cleaning, and ultrasonic cleaning. Oakite Products Inc., 134 E. Rector St., New York 6, N. Y.

Emission Instrument Data

"An Introduction to Emission Spectrochemical Instruments" describes the basic principles of operation, typical applications, and the Baird-Atomic line of emission instruments. Baird-Atomic Inc., 33 University Rd., Cambridge 38, Mass.

Solvent Use Discussed

A 36 page booklet, No. 44-A, contains information on Nialk trichlorethylene, a chlorinated solvent characterized by its high degree of purity, uniformity of quality, and chemical stability. The booklet suggests applications, including vapor degreasing. Hooker Chemical Corp., Box 344, Niagara Falls, N. Y.

Thread and Gear Cutting

A 36 page engineering manual contains material on all phases of threading by the multiple thread milling process and the hobbing of fine pitch gears. Hanson-Whitney Co., Hartford, Conn.

NEW BOOKS

Bolt, Nut and Rivet Standards, Industrial Fasteners Institute, 1517 Terminal Tower, Cleveland 13, Ohio. 288 pages, $3

This third edition includes all current engineering standards, including those made since the 1952 edition. It brings together into one volume the nationally recognized dimensional standards for general purpose industrial fasteners. Included are fastener specifications and standards, grade markings, locknut specifications, terminology, and unified screw thread standards.

Elevated Temperature Properties of Cast Iron, J. R. Kattus and Bryan McPherson, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 96 pages, $4.25

Six commercial low-alloy gray irons and one unalloyed ferritic nodular iron are evaluated at 800 and 1000° F by metallographic examination, tension, creep-rupture, thermal shock, and growth tests. Both as-cast and annealed structures are investigated. The objective of the research which led to this report was to determine the suitability of cast iron alloys for load carrying applications at elevated temperatures. Test results are presented and illustrated with graphs, tables, and photomicrographs.

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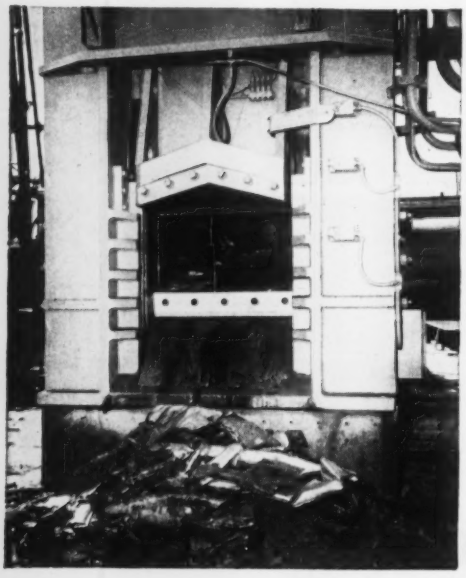
AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

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Hydraulic Engineers Since 1889

CORDELE, GEORGIA

Talk with a Man from Harris

October 5, 1959

Year's Output to Hit 95 Million Tons

LOOK FOR steel ingot production to hit 95 million tons this year if the strike ends by Oct. 15. Output to date has been about 72.6 million tons. If the strike ends this week—either by Taft-Hartley injunction or through a new contract—October production will be about 7 million tons. If it ends next week, the month's output will be closer to 5 million.

Assuming that the ten month total is 78 million to 80 million tons and that November-December operations will average 90 per cent of capacity (21.2 million tons), the year's output could reach 100 million. That's possible if: 1. Labor and management reach a voluntary settlement soon. 2. Furnaces don't require extensive repairs.

WHAT STRIKE HAS COST—Had there been no strike, third quarter operations would probably have averaged 65 per cent of capacity, equivalent to 23 million tons. Because of the strike, output was only 8.1 million. Almost 15 million tons were lost in the third quarter alone. Had the walkout been averted, fourth quarter operations would probably have averaged 85 per cent of capacity, equivalent to 30 million tons. Under the circumstances, 28 million is the best that can be expected. Before the strike, it was generally believed that 1959 production would equal or exceed the record 117 million tons poured in 1955. Now it's clear that this year's output will fall at least 17 million tons short of the mark, perhaps as much as 22 million.

BRIGHT OUTLOOK FOR '60—Next year, steel production will spurt to a record 120 million ingot tons, predicts William P. Carlin, Republic Steel Corp. economist. First half output of 65 million tons will reflect inventory building and a 10 to 15 per cent increase in consumption, he believes. Other predictions: 7 million U. S. built cars, a bigger year for appliances, a 33 per cent increase in freight car orders, higher consumption for oil and gas pipelines.

SHORTAGES TAKE TOLL— Throughout the country, steel shortages are forcing manufacturers and construction companies to curtail their operations. Inventories have fallen from a record high of 26 million tons to a working minimum of 12 million to 14 million, and many are out of balance. Service center stocks are down to 2 million tons (from 3.7 million at the start of the strike). Shortages of flat rolled products, heavy plates, wide flange beams, bar size angles, large rounds, and alloy bars are acute.

PRODUCTION MEN ON SPOT— Allocation of semifinished material won't be the least formidable of the problems facing steelmakers and their customers when operations resume. Says a product manager: "We have 50,000 tons of slabs ready for rolling into plates, but I'm wondering how long it will be before I'll ship my next 50,000. The sheet boys are going to be fighting tooth and nail for ingots."

OUTPUT EDGES UPWARD—Last week, steelmaking operations climbed to 13 per cent of capacity, two-tenths of a point above the previous week's revised rate. Production was about 368,000 ingot tons. STEEL's composite price on the prime grade of heavy melting scrap jumped $2.00 to $43.00 a ton.

WHERE TO FIND MARKETS & PRICES

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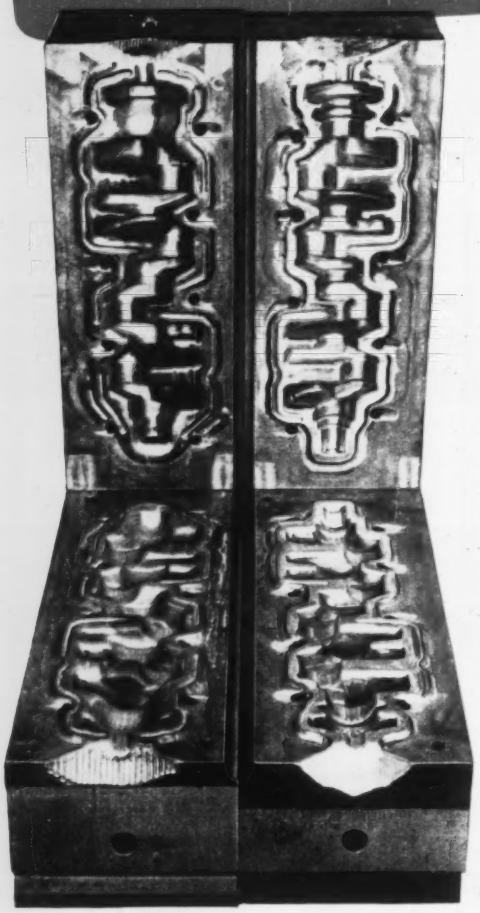
*Current prices were published in the Sept. 28 issue and will appear in subsequent issues.

Finkl die blocks and forgings made of vacuum degassed steel*



*

REDUCE DOWNTIME

Finkl vacuum degassed steels result in die blocks, hot work die steels, and forgings with greater ductility and toughness. This means that size for size, and/or hardness for hardness, the degassed steel reduces the chances of breakage and excessive wear under severe operating conditions.

*

REDUCE MACHINING TIME

Finkl vacuum degassed steels are cleaner. About 50% of the nonmetallic inclusions have been removed. Machineability is improved, with higher lusters obtainable in die block impressions, if desired. Fewer tool regrinds are required.

*

ASSURE DELIVERY

Finkl vacuum degassed steels promote high density centers in large die blocks and forgings therefore reducing the possibility of late shipment because of ultrasonic rejection.

DIE BLOCKS · FORGINGS · HOT WORK STEELS · ELECTRIC FURNACE STEELS ·

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For over 80 years Finkl has been producing top quality products. Now with the introduction of vacuum degassing of our electric furnace steels we have the most complete control of quality which enables us to offer the finest in die blocks, hot work die steels and flat die forgings. Call your Finkl representative.

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Component Stocks Are Adequate—Now

Despite surprisingly high inventories, strikes start to hurt. Some 30 per cent of respondents see cutbacks in operations if they don't get more steel soon

ALTHOUGH component inventories are dropping, they're surprisingly high in view of the steel and copper strikes. STEEL's quarterly survey also shows the walkouts have had varying effects on component stocks.

Reserves are generally at 30 to 60 day levels. The number of people in the under-ten-day category declined; those at the over-three-month level reported stocks were either down or the same. Other categories showed a mixed pattern. Because of increases in spot shortages within the last week or so, stocks may be in slightly shorter supply than indicated in the table.

• **Well Prepared**—Purchasing agents don't seem to be surprised by their comparatively good position. Over 62 per cent of the respondents say inventories are at the same levels they expected them to be at this time. Only 15 per cent say they are lower, while 23 per cent report they are higher. The good job buyers did in stockpiling for the steel, nonferrous, and rubber strikes and a brisk business pace in the last half becomes more apparent with the passage of time.

But the situation must be qualified. A special survey taken early last month (STEEL, Sept. 7, p. 43), revealed 22 per cent of the component buyers felt a shortage of parts would seriously curtail at least a portion of their operations. The figure is now closer to 30 per cent. Tops on the critical list are bearings, stampings, electrical goods, and pipe. Sheets and plates were also mentioned by several of the respondents.

• **Deliveries Slow**—The number of respondents having delivery problems remained slightly over 40 per cent—the figure has held since July. Bearings are causing the most difficulties. They have all year. Electrical goods and castings are also high on the list. When new orders pour in after the strikes end, further delivery problems are anticipated until the mills are back in full production.

Overstocks were mentioned by 12 per cent of the purchasing agents. Electrical goods lead. Forgings, castings, and fasteners were also noted.

• **Outlook**—Buyers of parts are optimistic and think the present inventory situation will be about the same by the end of the quarter. More than 63 per cent of the respondents foresee the same position on Jan. 1. About 21 per cent expect a further decline, and 16 per cent predict an increase.

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR UNDERSCORED figures show how most respondents reported.

STEEL
QUARTERLY SURVEY

COMPONENTS	CURRENT INVENTORIES					4th Quarter FORECAST		
	UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	LOWER	SAME	HIGHER
CASTINGS . . . . . Die, gray iron, malleable, nonferrous, steel.	2%	17%	59%	19%	3%	20%	61%	19%
OTHER FORMED COMPONENTS . . . . Forgings, stampings, springs, wire shapes.	1%	16%	41%	30%	12%	25%	58%	17%
MACHINED COMPONENTS . . . . . Bearings, couplings, cylinders, gears, screw machine products.	2%	19%	43%	23%	13%	22%	60%	18%
ELECTRICAL EQUIPMENT, MOTORS . .	4%	33%	40%	13%	10%	21%	64%	15%
FASTENERS	2%	21%	53%	16%	8%	22%	61%	17%
MECHANICAL RUBBER GOODS, BELTING	—	29%	49%	19%	3%	19%	72%	9%

NEED FABRICATIONS?

Ask for the New 40-page

KIRK & BLUM

Sheet and Plate Fabrication Catalog

SEE the endless variety of products, over 100 illustrations, contract manufactured since 1907 by Kirk & Blum in sheet and plate to ½" thickness, as well as light structurals.

SEE the extensive facilities and equipment of Kirk & Blum's 170,000 sq. ft. plant . . . for steel and alloy fabrications up to 25 tons.

SEE how Kirk & Blum can handle your needs, for 1 or 1000 units, economically and promptly, with traditionally high K & B quality.

Simply clip and send coupon below for your copy.

THE KIRK & BLUM MANUFACTURING CO. 3226 Forrer St., Cincinnati 9, Ohio

Please send me my copy of new Fabrication Catalog.

Name_____ Title_____

Firm_____

Address_____

City_____ Zone_____ State_____

Canadian Steel Producers Under Increased Pressure

Canadian steel mills are operating full tilt, but their customers aren't satisfied, and pressure from U. S. steel users seeking supplies is on the increase.

Officials of Canadian mills say their regular (Canadian) customers come first. Canadian users who ordinarily bought American steel when it suited their purposes have turned all their business to home mills.

Steel Imports Smaller At Chicago in August

Up to now, foreign steel coming into the Chicago market area was ordered prior to the steel strike. From now on much of the tonnage will be products ordered since the strike's start.

Surprisingly, less foreign steel arrived at the Port of Chicago via the St. Lawrence Seaway in August than in July and June. The August total was 27,803 tons vs. 37,459 in July, and 35,635 in June.

West Coast Steel Pinch Eased by Heavy Imports

Imports are staving off steel shortages on the West Coast. Shipments from Japan, Europe, and Australia have been stepped up noticeably in the last several months.

One seller in San Jose, Calif., is advertising (in San Francisco newspapers) many kinds of imported steel products for sale. Included are angles, channels, beams, plates, flats, rounds, and sheets.

Western States' Steel Take Cut 18 Per Cent

Receipts of steel products during 1958 in seven western states (California, Washington, Oregon, Utah, Arizona, Nevada, and Idaho) were down 18 per cent from the preceding year. At 5,540,000 net tons, the total was the smallest since 1954, reports the General Planning Div., Kaiser Steel Corp., Oakland, Calif.

The report, prepared under direction of B. E. Etcheverry, shows

the decline in the West contrasted with a drop of 24 per cent nationally. The more favorable western showing was due to strong demand for tin mill products, which are twice as important proportionately in the western market as they are nationally. Also, low auto production was reflected in a greater national decline in receipts of hot rolled and cold rolled sheets compared with the West where auto production is of lesser importance.

Steel Bars . . .

Bar Prices, Page 141

Carbon bar inquiry is brisk, but consumers are finding it virtually impossible to obtain firm delivery promises from the mills before the end of this year, even assuming the strikebound plants have resumed operation by mid-October. There's less supply stringency in alloy bars, but cold drawn bars are tightening steadily. More converters have been forced to close down for lack of hot bar stock.

Rebuilding of bar stocks to normal level will be more difficult than was the buildup of inventories in preparation for the strike shutdown.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 142

Shortages of steel are slowing up highway and expressway construction in the Midwest, particularly in northern Illinois. Reinforcing material is causing trouble in some areas. Supplies of bars are nearing exhaustion, and there are reports of broker offerings to contractors of small lots at prices above the standard market level. Some localities report increasing shortages of reinforcing mesh, and considerable shifting of material from one job to another.

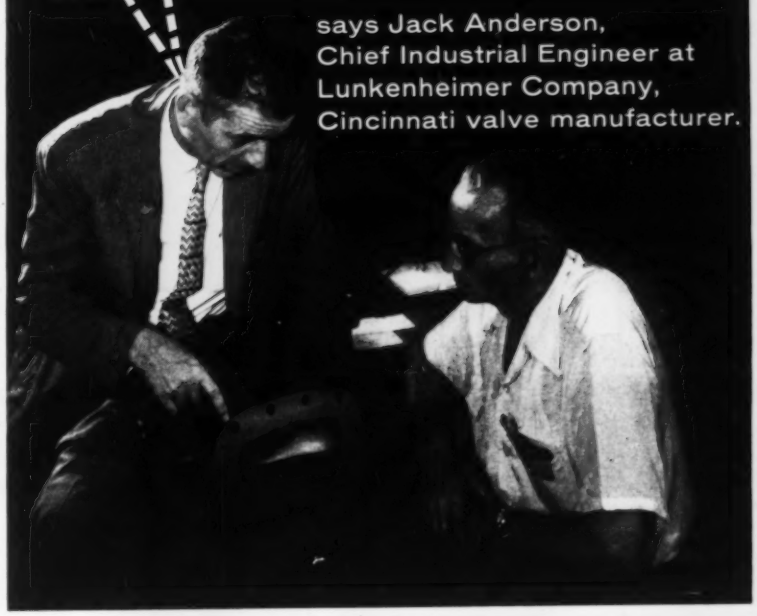
Sheets, Strip . . .

Sheet & Strip Prices, Pages 142 & 143

Sheetmakers have booked more tonnage than they can possibly deliver over the remainder of this year. Some producers, who are not strikebound, are now a month or more behind on deliveries and are considering blanking out a delivery period to get in balance on commitments. Strikebound mills are about one full quarter behind in their schedules.

A large Pittsburgh seller is sold

This was our biggest production bottleneck . . . until we got Spiral Points*



says Jack Anderson, Chief Industrial Engineer at Lunkenheimer Company, Cincinnati valve manufacturer.

"Just two of these holes are critical—all other machining operations are located from them. But it used to cost us plenty to get them right—frequent drill resharpening, slower feeds, touching up the holes, even special locating pins and eccentric guide bushings.

"It sounds like a miracle, but our spiral point drills broke this production bottleneck completely! They maintained consistent hole size, well within our plus .005″ minus .004″ tolerance. They don't walk, so guide bushing wear has been practically eliminated. And, where we used to get 225 to 250 parts per drill grind, we now average 2000 or better.

"In short, they drill holes where we want them, to the size we want them . . . in one pass. Now production stays on schedule . . . scrap is negligible."

*Spiral point is Cincinnati's new drill point geometry which transforms a standard twist drill into a cost-reducing, precision tool. Cincinnati's SPIROPOINT® DRILL SHARPENER automatically applies this new point geometry in a matter of seconds.

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out on cold rolled sheets for this year but is still taking hot rolled orders for November-December. No orders are being accepted for first quarter, 1960. A producer of sheet specialties estimates its strip customers are adequately stocked for another 30 days. It is taking all the new tonnage offered, some of it for first quarter shipment.

Tin Plate . . .

Tin Plate Prices, Page 143

Metal can shipments in July totaled 502,476 tons vs. 444,711 in June, and 477,800 in July a year ago, reports the U. S. Bureau of the Census. The total for the first seven months was 2,692,688 tons vs. 2,557,474 in the like 1958 period.

Distributors . . .

Prices, Page 146

Steel service centers note a sharp increase in demand as steel supplies of consumers approach the critical stage. It won't be long before stocks of some grades and sizes will be virtually exhausted. Shortages are severest in galvanized sheets and strip, followed by hot and cold rolled sheets. Gaps are widening in bars and wide flange structurals. Plate supplies appear ample.

Distributors expect little relief from strike-bound mills for at least a month after they resume operations. This may mean the premium price market, which is reported developing at several points, will pick up steam and continue for some time after the mills get back into production.

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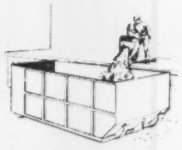
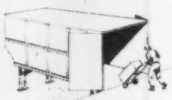
Here's the detachable container system of a hundred uses. The simple, powerful, one-man DEMPSTER-DINOSAUR automatically picks-up . . . hauls . . . dumps . . . puts down . . . or pushes off on dock, loads limited only by the size of the truck or by highway restrictions. All handling operations are performed without the driver leaving the cab . . . no cables to hook on . . . no chains . . . . . . sheaves . . . winches. Models available for single or tandem axle chassis . . . 22,000 to 30,000 pound gross loads. Containers, six to 40 cu. yds. and over, available for refuse, scrap, materials handling, cargo, "boxy-back" rail shipments and many other uses. Write today for brochure or for a demonstration in your city.



REFUSE AND SCRAP COLLECTION

MATERIALS HANDLING

"BOXY-BACK" RAIL TRANSPORT



CARGO HANDLING

Patents Pending DEMPSTER BROTHERS INC

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Tubular Goods . . .

Tubular Goods Prices, Page 145

Some pipemakers are taking orders for November-December. One Pittsburgh executive says customers can expect delivery of buttweld 30 days after the strike. In seamless, however, backlogs are so large users may have to wait two months for anything they order today.

Oil country customers' inventories are shrinking, but it isn't likely that a lack of steel will force curtailment of drilling programs. Rotary drilling spurted in the week ended Sept. 21. Hughes Tool Co.'s survey showed 2132 rigs operating vs. 1909 a year ago.

When producers of oil country goods reopen their books, they'll sell on a quota basis, using a 45 day leadtime. "We'll have a full order book all next year on tubing and casing," a sales executive predicts.

Plates . . .

Plate Prices, Page 141

Plates are in increasingly heavier demand, partly reflecting a seasonal upswing in domestic fuel tank requirements. Chemical and oil refinery needs are still expanding.

One large platemaker is promising deliveries against new orders in 14 to 16 weeks after the strike.

Alan Wood Steel Co., Conshohocken, Pa., has "substantially" completed plans for the enlargement of facilities, including construction of a wide combination blooming mill and plate mill to replace present equipment. Stockholders vote Oct. 8 on a management proposal to eliminate the company's $25 million debt ceiling. It's reported the new facilities will enable the company to produce plates up to 96 in. wide and 4 in.

thick, compared with its present maximum (72 in. wide and ¾ in. thick).

Pig Iron . . .

Pig Iron Prices, Page 146

Although foundry operations are sustained and various producers are strikebound, merchant pig iron supply continues adequate. Some furnaces are still operating, and some furnaces now out of production have fairly good stocks at distribution points. There is also a fair mount of imported iron, especially along the eastern seaboard.

Mystic Iron Works, Everett, Mass., has listed unchanged prices to contract customers for the fourth quarter. The freight rate from Boston to Springfield, Vt., has been reduced to $4.85 per gross ton from $7.85, minimum weight of 40 tons.

August Pig Iron Output Cut Sharply by Strike

Blast furnace production (pig iron and ferroalloys) declined in August to 947,779 net tons vs. 3,573,550 in July, and 4,799,955 in August, 1958, reports the American Iron & Steel Institute.

Steel ingot production in August (revised figure) was 1,439,277 net tons, reports the institute.

Structural Shapes . . .

Structural Shape Prices, Page 141

Fabricated structural bookings and shipments dropped in August, reports the American Institute of Steel Construction. Chief reason: The steel strike. Postponed work, it's thought, will be quickly absorbed following the settlement because of the recently expanded mill capacity.

August bookings were 196,985 tons, off 24 per cent from the previous month. Bookings for the first eight months of 1959 were 2,068,369 tons, 14 per cent better than in the same period last year.

Shipments in August were 220,420 tons, dipping 8 per cent below July's. Accumulated shipments for the period January-August totaled 2,110,040 tons vs. 2,505,778 in the like 1958 period.

Backlogs as of Aug. 30 totaled 1,771,883 tons, of which 1,092,947 tons were scheduled for fabrication during the four months ended Dec. 31.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

14,000 tons, superstructure, Damen Avenue viaduct, 37th to 47th Streets, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

2980 tons, state highway bridge, Clinch River, Roane County, Tennessee, to American Bridge Div., U. S. Steel Corp., Pittsburgh; Maxon Construction Co., Dayton, Ohio, general contractor.

2960 tons, six state highway bridges, Lynnfield-Peabody, Mass., to Standard Structural Steel Co., Hartford, Conn.; Berke-Moore Co. Inc., Boston, general contractor.

2820 tons, Morgan Street viaducts (two) and ramps, Hartford, Conn., to City Iron Works, Wethersfield, Conn.; Savin Bros. Inc., Bloomfield, Conn., general contractor.

2300 tons, building, St. John's Riverside Hospital, Yonkers, N. Y., to Grand Iron Works, New York.

1400 tons, nylon yarn plant, Chemstrand Corp., Greenwood, S. C., to Southern Engineering Co., Charlotte, N. C.; Daniel Construction Co. Inc., Greenville, general contractor; 300 tons, reinforcing bars, to Steel Fabricators, Gastonia, N. C.

1300 tons, eight highway structures, Chelmsford-Lowell, Mass., to Harris Structural Steel Co., New York; Campanella & Cardi Construction Co. Inc., Hillsgrove, R. I., general contractors; 756 tons, concrete bars to Northern Steel Inc., Boston.

1385 tons, federal office building, Richmond, Va., to Virginia Steel Co., Richmond; Wise Construction Co., Richmond, general contractor.

1145 tons, eight state highway bridges (34-103 and 105) Danbury, Conn., to Standard Structural Steel Co., Hartford, Conn.; Oneglia & Gervasini Inc., Torrington, Conn., general contractor.

1000 tons, structurals and reinforcing bars, veterans' hospital and regional office, Jack-

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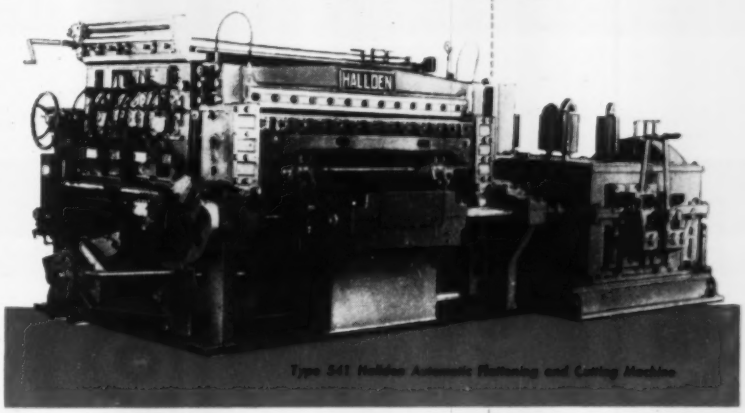

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METALS ENGINEERS AT WORK
L/R: Dr. Ralph Leiter, Director of Laboratories, and Charles B. Allen, Chief Metallurgist (Red Lion Plant)
—The Budd Company

Other ASM Activities: METALS REVIEW • METAL SHOWS • METALS ENGINEERING INSTITUTE • METALS HANDBOOK • TRANSACTIONS • TECHNICAL BOOKS

son, Miss., to Orleans Materials & Equipment Co., New Orleans (structurals), and Contractor's Materials Co., Jackson (reinforcing); J. A. Jones Construction Co., Nashville, Tenn., general contractor.

1000 tons, building, J. J. Newberry, Woodside, Long Island, N. Y., to the Grand Iron Iron Works, New York.

900 tons, state bridgework, Suffolk County, New York, through Hendrickson Bros., general contractor, to Ingalls Iron Works, Birmingham.

900 tons, Bayview Manor Home, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Cawdrey & Vemo, Seattle, general contractor.

800 tons, three state bridges, Littleton, Mass., to American Bridge Div., U. S. Steel Corp., Pittsburgh; Bayer & Mingolla Construction Co. Inc., Worcester, Mass., general contractor; 400 tons, reinforcing bars, to Northern Steel Inc., Boston.

600 tons, state highway bridges, Shelby County, Indiana, to Central States Steel Co., Indianapolis; J. S. Sweet Co. Inc., Cambridge City, Ind., general contractor.

650 tons, buildings, St. Anselm's College, Manchester, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; Perini Corp., Framingham, Mass., general contractor; 120 tons, reinforcing bars, to Northern Steel Inc., Boston.

623 tons, state highway bridges, contract 4728, Wayne County, Indiana, to Bethlehem Steel Co., Bethlehem, Pa.; DeBolt Construction Co. Inc., Richmond, Ind., general contractor.

625 tons, Peer Park High School, Babylon, N. Y., to Bethlehem Fabricators, Bethlehem, Pa.

620 tons, two 4-span composite wide flange beam bridges, contract No. 2, Putney, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; Perini Corp., Framingham, Mass., general contractor.

500 tons (estimated) research and development center, Foote Mineral Co., Exton, Pa., to Frank M. Weaver Inc., Lansdale, Pa.; Wark & Co., Philadelphia, general contractor.

500 tons, factory building, Rentar Mfg. Co., Union Turnpike, Queens, N. Y., to Grand Works, New York.

450 tons, structurals and bars, business administration building, and library, University of Hartford, Hartford, Conn., to Haarmann Steel Co., Holyoke, Mass. (structurals), and Scherer Steel Co., Hartford (reinforcing); A. F. Peaslee Inc., Hartford, general contractor.

425 tons, four state highway bridges, Westford, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Suburban Excavators Inc., Wakefield, Mass., general contractor.

400 tons, junior-senior high school, Millis, Mass., to Builders Iron Works, Somerville, Mass.; Park Construction Co. Inc., Boston, general contractor.

400 tons, office and warehouse, Grand Union Co., Landover, Md., through the Sardoni Co., Wilkes Barre, Pa., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

330 tons, three state highway bridges, Chelmsford, Mass., to West End Iron Works, Cambridge, Mass.; Wes-Julian Construction Co., Dedham, Mass., general contractor.

350 tons, reinforcing and structurals, Mercy High School for Girls, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa. (reinforcing) and Maryland Steel Products Co. Inc., Baltimore (structurals); Consolidated Engineering Co., Baltimore, general contractor.

300 tons, Chinese Community Center, Mott St., New York, to Grand Iron Works, New York.

300 tons, six story apartment, Marshall Ave. and 259th St., Bronx, N. Y., to Grand Iron Works, New York.

295 tons, Minuteman facilities, Complexes 31 and 32, Patrick AFB, Florida, to Master Fabricators Inc., Atlanta; George A. Fuller Co., Atlanta, general contractor.

290 tons, two 4-span composite wide flange beam bridges, Brattleboro-Dummerston, Vt., to City Iron Works, Wethersfield, Conn.; Perini Corp., Framington, Mass., general contractor.

STRUCTURAL STEEL PENDING

13,700 tons, including 7450 tons, low alloy, superstructure, Balboa Bridge, Panama Canal; bids Dec. 2; also 635 tons, reinforcing bars, and 13,500 linear feet of wire rope suspenders.

7500 tons, lift stand, Harlem River, New York

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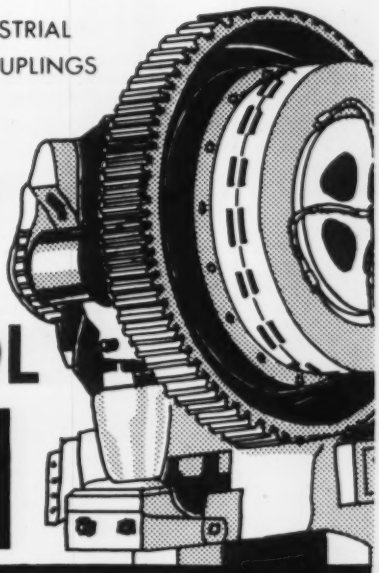

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Department of Public Works, New York; bids closed Oct. 1.

3500 tons, United Engineering Center, United Nations Plaza, New York; bids closed Sept. 29; Turner Construction Co., general contractor.

2425 tons, state highway bridge, Attleboro and North Attleboro, Mass. (four contracts); Campanella & Cardi Construction Co., Inc., Hillsgrove, R. I., low on all four.

2000 tons, shopping center, Milburn, N. Y.; bids closed Sept. 30.

2000 tons, state bridgework, Oswego County, New York; bids Oct. 15.

2000 tons, state bridgework, St. Lawrence County, New York; bids Oct. 15.

1600 tons, office research, and manufacturing building, Norden-Ketay Corp., Stamford, Conn.; Wigton-Abbott Construction Co., Passaic, N. J., general contractor.

1000 tons, state bridgework, Saratoga County, New York; bids Oct. 15.

1000 tons, Industrial Labor Relations Building, Ithaca, N. Y.; bids asked.

640 tons, Bomarc facilities, Langley (Va.) Air Force Base.

600 tons, Triangle Motor Hotel, Roanoke, Va., bids closed Oct. 1.

600 tons, radio installation, Navy, Cutler, Maine; bids in.

400 tons, cultural building, Hopkins Center, Dartmouth College, Hanover, N. H.; bids Oct. 4.

295 tons, steel piling, bridges, East Providence, R. I.-Seekonk, Mass.

150 tons, gantry furnace facilities, General Electric Co., Evandale, Ohio; bids asked.

127 tons, Chase Road Bridge, Bangor-Veazie, Maine; bids Oct. 7 to Augusta, Maine.

125 tons, laundry addition, Willowbrook, Staten Island, N. Y., Rocklyn Construction Co., general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, office building, National Institute of Health, Bethesda, Md., to Bethlehem Steel Co., Bethlehem, Pa.; Norair Engineering Corp., Washington, D. C., general contractor.

1200 tons, U. S. Courthouse and federal office building, Oklahoma City, Okla., to Capital Steel & Iron Works, Oklahoma City; J. W. Bateson Co. Inc., Dallas, general contractor.

784 tons, state highway bridge, Clinch River, Roane County, Tennessee, to Steel Service Co. Inc., Nashville, Tenn.; Maxon Construction Co., Dayton, Ohio, general contractor.

635 tons, state highway structures, including two, 4 span composite wide flange bridges, Brattleboro-Dummerston, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; Perini Corp., Framingham, Mass., general contractor.

400 tons, state highway bridges, Shelby County, Indiana, to Jones & Laughlin Steel Corp.; J. S. Sweet Co. Inc., Cambridge City, Ind., general contractor.

337 tons, state highway structures, contract 4728, Wayne County, Indiana, to Holliday Steel Div., Jones & Laughlin Steel Corp., Indianapolis; DeBolt Construction Co. Inc., Richmond, Ind., general contractor.

300 tons, state highway structures, Westford, Mass., to Northern Steel Inc., Boston; Suburban Excavators Inc., Wakefield, Mass., general contractor.

200 tons or more, plant building and additions, Armstrong Cork Co., Macon, Ga., to Techsteel Inc., Atlanta; Beers Construction Co., Atlanta, general contractor; fabricated structural steel to Belmont Steel Co.

135 tons, three state highway bridges, Hopkinton, N. H., to New Hampshire Sheet Steel Co., Manchester; J. F. White Contracting Co., Westwood, Mass., general contractor.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pennsylvania, 66 electric locomotives from General Electric Co., under a long term lease arrangement.

RAILROAD CARS PLACED

Northern Pacific, 400 boxcars and 25 seventy-ton covered hoppers to the Pullman-Standard Div., Pullman Inc., Chicago.

New York, New Haven & Hartford, 15 covered gondolas to the Johnstown, Pa., plant of Bethlehem Steel Co., Bethlehem, Pa.

Steel Shipments by Markets—July, 1959

(Net Tons)

Markets:	July 1959	July 1958	First Seven Months 1959	First Seven Months 1958
Converting	180,560	186,866	2,182,622	1,572,607
Forgings (except auto)	46,760	35,524	680,849	403,031
Fasteners	48,765	47,815	833,140	407,856
Warehouses:				
Oil & gas	124,793	67,818	1,388,042	531,766
All other	721,409	764,397	8,283,449	5,398,724
Total warehouse	846,202	832,215	9,671,491	5,930,490
Construction:				
Rail transportation	2,362	3,135	33,656	28,070
Oil & gas	166,172	189,410	1,872,044	1,294,873
All other	388,426	464,843	4,838,787	3,811,775
Total construction	556,960	657,388	6,744,487	5,134,718
Contractors' products	227,780	259,143	2,717,213	1,940,940
Automotive:				
Cars, trucks, parts	688,351	617,089	10,329,820	4,598,379
Forgings	19,108	12,995	329,518	130,963
Total automotive	707,459	630,084	10,659,338	4,729,342
Rail Transportation:				
Rails, track, etc.	41,058	24,299	686,499	393,011
Cars & locomotives	90,566	24,238	1,203,963	509,627
Transit systems	1,804	1,337	17,852	12,885
Total railroad	133,428	49,874	1,908,314	915,523
Shipbuilding	43,204	50,592	514,182	490,699
Aircraft	4,670	4,104	48,210	34,125
Oil & gas drilling	26,953	14,069	431,826	169,622
Mining, etc.	12,844	7,943	182,721	105,081
Agricultural:				
Machinery	62,518	57,821	731,593	512,021
All other	24,331	31,235	228,425	160,057
Total agricultural	86,849	89,056	960,018	672,078
Machinery, tools, etc.	283,299	189,558	3,178,679	1,718,647
Elec. machinery, etc.	114,054	94,316	1,536,902	977,058
Appliances, etc.	103,532	94,516	1,362,527	787,920
Other equipment	106,599	100,311	1,383,908	935,695
Containers:				
Cans and closures	265,926	454,008	3,879,867	3,181,786
Barrels, etc.	43,739	49,113	591,748	440,000
All other	19,814	30,130	4,863,113	3,885,000
Ordnance, military	6,076	19,107	103,610	147,115
Nonclassified	183,625	52,789	1,204,748	376,029
Total domestic shipments	4,049,098	3,948,521	51,167,898	31,333,576
Exports	82,169	133,223	1,165,702	1,439,344
Total shipments	4,131,267	4,081,744	52,333,600	32,772,920

Data from American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Oct. 4	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	— 0.5	65	84.5
Chicago	5.5	0	78.5	85
Eastern	11	+ 1	66	86
Youngstown	9	0	54	75
Wheeling	53.5	+ 2	75	96.5
Cleveland	6	0	74	87
Buffalo	4	0	58.5	100
Birmingham	9	0	62	72
Cincinnati	77	+11*	75	78
St. Louis	61	— 5*	91	94.5
Detroit	25	— 0.5*	78.5	98.5
Western	6	0	75	95
National Rate	13	+ 0.2*	68.5	82

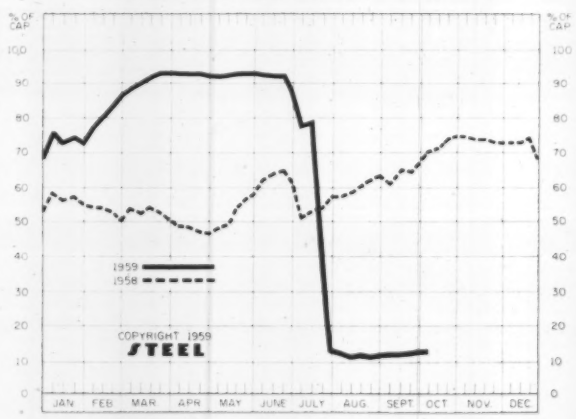
INGOT PRODUCTION

	Week Ended Oct. 4	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	22.9†	22.5	20.7	118.3
NET TONS (In thousands)	368†	362	332	1,901

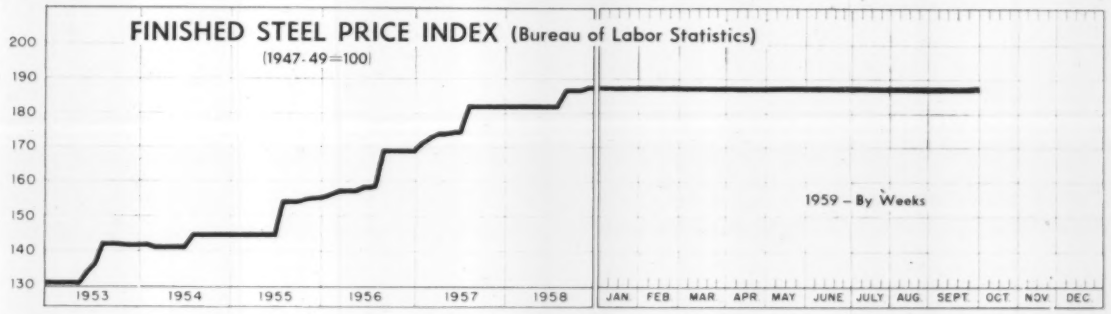
*Change from preceding week's revised rate. †Estimated by STEEL; comparative figures reported by AISI.

Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Sept. 29, 1959	Week Ago	Month Ago	Sept. Index	Year Ago
186.7	186.7	186.7	186.7	186.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 29

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R.; Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 30 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg.=100)	247.82	247.82	247.82	246.65	194.19
Index in cents per lb	6.713	6.713	6.713	6.682	5.261

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.28	$117.77
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	43.00	41.00	39.00	43.00	30.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 30 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

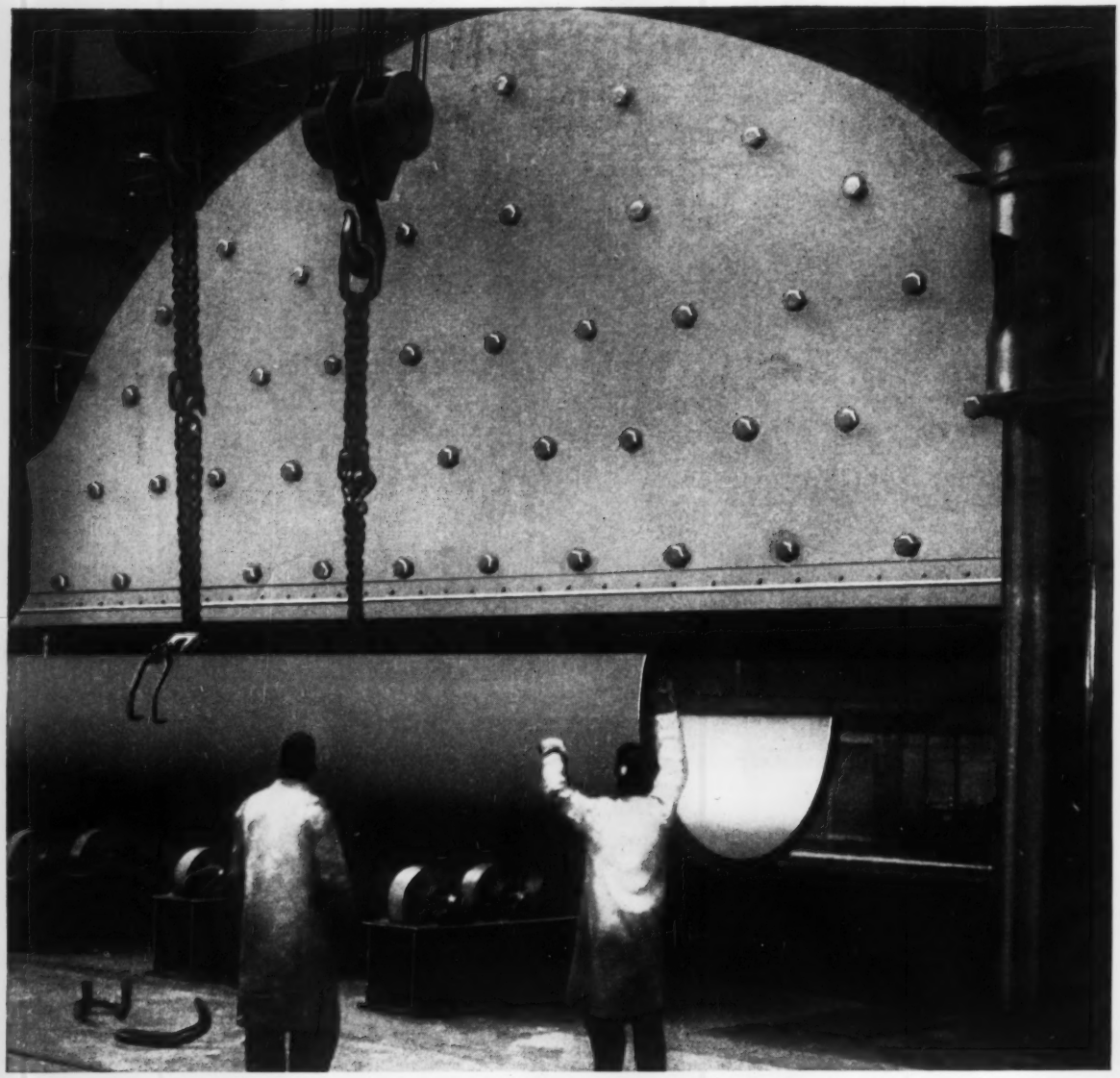
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods $\frac{7}{32}$-$\frac{5}{8}$" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton	Sept. 30 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	49.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	50.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$44.50	$41.50	$38.50	$43.50	$30.50
No. 1 Heavy Melt, E. Pa.	44.00	41.00	40.00	42.00	29.00
No. 1 Heavy Melt, Chicago	40.50	40.50	38.50	43.50	32.00
No. 1 Heavy Melt, Valley	43.50	43.50	41.50	43.50	32.50
No. 1 Heavy Melt, Cleve.	40.50	39.50	38.50	40.00	30.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	34.50	28.50
Rails, Rerolling, Chicago	62.50	62.50	61.50	64.50	51.50
No. 1 Cast, Chicago	56.50	55.50	53.50	46.50	38.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25



IF FORMING HEAVY PLATE IS YOUR PROBLEM, consider the dimensions of work handled by Foster Wheeler. Steel plates up to 9″ thick or up to 40′ long can be formed on Foster Wheeler's 8000-ton beam press. Plates 2″ thick or less can be formed to a minimum of 8½″ ID.

Our facilities permit fabrication of pressure vessels, drums or cylinders up to 12′ in diameter, 100′ long, weighing up to 200 tons. Also available: mechanical design and drafting; complete machining, welding, stress relieving and x-ray services; and any special inspection and quality control procedures you may require.

Any single service or combination of services may be contracted for according to your specific requirements. You may wish to furnish material, or leave procurement to us.

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Heat Engineered products, plants and processes . . . for the world's industrial progress.

FOSTER WHEELER

NEW YORK LONDON PARIS ST. CATHARINES, ONT.

Steel Prices

Mill prices as reported to STEEL, Sept. 30, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 142; footnotes, page 144.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 .. 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 .. 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 .. 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2.. 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 .. 99.50
S.Duquesne,Pa. U5 .. 99.50
S.SanFrancisco B3 ... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 .. $119.00
Bridgeport,Conn. C32.. 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 .... 119.00
Conshohocken,Pa. A3.. 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 .... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 .... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 .. 119.00
Johnstown,Pa. B2 .... 119.00
Lackawanna,N.Y. B2.. 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 .. 119.00
S.Duquesne,Pa. U5 ... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 .... 5.05

WIRE RODS
AlabamaCity,Ala. R2 .. 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 .... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1.. 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 .... 6.65
Monessen,Pa. P7 ..... 6.40
Pittsburg,Calif. C11 .... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14.. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 .... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 .... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1.. 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 .. 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 .... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 .... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5 W14.. 5.50
S.SanFrancisco B3 .... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 .... 6.20
Weirton,W.Va. W6 .... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2.. 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 .... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W16 .... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14.. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1.. 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 .... 8.15
Lackawanna,N.Y. B2 .. 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14.. 8.05
S.SanFrancisco B3 .... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 .... 8.05
Lackawanna,N.Y. B2 .. 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 .... 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 .... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 .... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 .... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 .... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 .... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 .... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5 W14.. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown(27) R2 .... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton Pa. U5 ..... 7.95
Claymont,Del. C22 .... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 .... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.96
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14.. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 .... 7.50
Coatesville,Pa. L7 .... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 .... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 .... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14.. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .. 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 .. 5.675
Aliquippa,Pa.(9) J5 .. 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .. 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 .. 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .. 5.675
Emeryville,Calif. J7 .. 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 .... 5.825
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1.. 5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 .... 5.675
LosAngeles(9) B3 .... 6.375
Massillon,O.(23) R2 .... 6.15
Midland,Pa.(23) C18 .. 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Owensboro,Ky.(9) G8 .. 6.025
Pittsburg Calif.(9) C11.. 6.375
Pittsburgh(9) J5 .... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle A24, B3, N14 .. 6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5.. 5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15.. 5.675
Sterling,Ill.(9) N15 ... 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda,N.Y. B12 .. 5.675
Torrance,Calif.(9) C11.. 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5.. 5.675

Bars, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem Pa. B2 ..... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O R2, T7 .... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 6.725
Johnstown,Pa. B2 .... 6.725
KansasCity,Mo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 .... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14.. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 .. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 .... 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded
(Including leaded extra)
Carbon
LosAngeles P2, S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .... 10.175
BeaverFalls,Pa. M12.. 10.175
Camden,N.J. P13 .... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 .... 10.175
Newark,N.J. W18 .... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2.. 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .. 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. P7 ..... 7.65
Hammond,Ind. J5, L2 .. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2.. 9.10
Mansfield,Mass. B5 .... 8.20
Massillon,O. R2, R8 .. 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .. 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem Pa. B2 ..... 9.025
Bridgeport,Conn. C32 .. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 .... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. P7 ..... 9.025
Hammond,Ind. J5, L2.. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2.. 9.025
LosAngeles P2, S30 .... 11.00
Mansfield,Mass. B5 .... 9.325
Massillon,O. R2, R8 .. 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago,Ill. W14 .... 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 .. 9.325
Worcester,Mass. A7 .... 9.325
Youngstown F3, Y1 .... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 .....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill. (1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks. (S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts. (4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit (8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 ....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10.....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Allquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fee
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	...7.225	7.75
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	...7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	..7.225	7.475
Irvin,Pa. U5	...7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	..7.975	....
Pittsburgh J5	...7.225	....
SparrowsPt. B2	..7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 ..6.875*
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O. (28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ..8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel ofN.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	5.10
Allenport, Pa. P7	5.10
Alton, Ill. L1	5.30
Ashland, Ky. (8) A10	5.10
Atlanta A11	5.10
Bessemer, Ala. T2	5.10
Birmingham C15	5.10
Buffalo (27) R2	5.10
Conshohocken, Pa. A3	5.15
Detroit M1	5.10
Ecorse, Mich. G5	5.10
Fairfield, Ala. T2	5.10
Farrell, Pa. S3	5.10
Fontana, Calif. K1	5.825
Gary, Ind. U5	5.10
Ind. Harbor, Ind. I-2, Y1	5.10
Johnstown, Pa. (25) B2	5.10
Lackaw'na, N.Y. (25) B2	5.10
LosAngeles (25) B3	5.85
LosAngeles C1	8.60
Minnequa, Colo. C10	6.20
Riverdale, Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon, Pa. S3	5.10
S. Chicago, Ill. W14	5.10
S. SanFrancisco (25) B3	5.85
SparrowsPoint, Md. B2	5.10
Torrance, Calif. C11	5.85
Warren, O. R2	5.10
Weirton, W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie, Pa. S18	8.40
Farrell, Pa. S3	8.40
Gary, Ind. U5	8.40
Houston S5	8.65
Ind. Harbor, Ind. Y1	8.40
KansasCity, Mo. S5	8.65
LosAngeles B3	9.60
Lowellville, O. S3	8.40
Newport, Ky. A2	8.40
Sharon, Pa. A2, S3	8.40
S. Chicago, Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland, Ky. A10	7.575
Bessemer, Ala. T2	7.575
Conshohocken, Pa. A3	7.575
Ecorse, Mich. G5	7.575
Fairfield, Ala. T2	7.575
Farrell, Pa. S3	7.575
Gary, Ind. U5	7.575
Ind. Harbor, Ind. I-2, Y1	7.575
Lackawanna, N.Y. B2	7.575
LosAngeles (25) B3	8.325
Seattle (25) B3	8.575
Sharon, Pa. S3	7.575
S. Chicago, Ill. W14	7.575
S. SanFrancisco (25) B3	8.325
SparrowsPoint, Md. B2	7.575
Warren, O. R2	7.575
Weirton, W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	5.35
Warren, O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn, Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover, O. G6	7.425
Evanston, Ill. M22	7.525
Farrell, Pa. S3	7.425
Follansbee, W.Va. W10	7.425
Fontana, Calif. K1	9.20
FranklinPark, Ill. T6	7.525
Ind. Harbor, Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport, Pa. E10	7.525
NewBedford, Mass. R10	7.875
NewBritain, Conn. S15	7.875
NewCastle, Pa. B4, E5	7.425
NewHaven, Conn. D2	7.875
NewKensington, Pa. A6	7.425
Pawtucket, R.I. R3	7.975
Pawtucket, R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale, Ill. A1	7.525
Rome, N.Y. (32) R6	7.425
Sharon, Pa. S3	7.425
Trenton, N.J. (31) R5	8.875
Wallingford, Conn. W2	7.875
Warren, O. R2, T5	7.425
Worcester, Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie, Pa. S18	15.55
Cleveland A7	15.55
Dover, O. G6	15.55
Farrell, Pa. S3	15.55
FranklinPark, Ill. T6	15.55
Harrison, N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville, O. S3	15.55
Pawtucket, R.I. N8	15.90
Riverdale, Ill. A1	15.55
Sharon, Pa. S3	15.55
Worcester, Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn, Mich. S3	10.80
Dover, O. G6	10.80
Farrell, Pa. S3	10.80
Ind. Harbor, Ind. Y1	10.80
Sharon, Pa. S3	10.80
Warren, O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie, Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn, Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover, O. G6	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. M22	8.95	10.40	12.60	15.60	....
Farrell, Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria, O. S1	10.05	10.40	12.60	15.60	....
FranklinPark, Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison, N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain, Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle, Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven, Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington, Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket, R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome, N.Y. (32) R6	8.95	10.40	12.60	15.60	18.55
Sharon, Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton, N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford, Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren, O. T5	8.95	10.40	12.60	15.60	18.55
Worcester, Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria, O. S1	19.05	22.15	....
FranklinPark, Ill. T6	19.20	23.30	28.15
Harrison, N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer, Mass. W12	18.85	....	....
Trenton, N.J. R5	18.85	22.95	27.80
Worcester, Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton, W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover, O. G6	7.425*
Evanston, Ill. M22	7.525*
McKeesport, Pa. E10	7.50*
Riverdale, Ill. A1	7.525*
Warren, O. B9, S3, T5	7.425*
Worcester, Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell, Pa. S3	7.50
Sharon, Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell, Pa. S3	5.525
Riverdale, Ill. A1	5.675
Sharon, Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$9.10	$9.35	$9.75
Fairfield, Ala. T2	9.20	9.45	9.85
Fairless, Pa. U5	9.20	9.45	9.85
Fontana, Calif. K1	9.75	10.00	10.40
Gary, Ind. U5	9.10	9.35	9.75
GraniteCity, Ill. G4	9.20	9.45	9.60
IndianaHarbor, Ind. I-2, Y1	9.10	9.35	9.75
Irvin, Pa. U5	9.10	9.35	9.75
Niles, O. R2	9.10	9.35	9.75
Pittsburg, Calif. C11	9.75	10.00	10.40
SparrowsPoint, Md. B2	9.10	9.35	9.75
Weirton, W.Va. W6	9.10	9.35	9.75
Yorkville, O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)

IndianaHarbor, Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles, O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa, Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, Hot Dipped

	Common Coke	1.25 lb	1.50 lb
Aliquippa, Pa. J5	$10.40	$10.65	
Fairfield, Ala. T2	10.50	10.75	
Fontana, Calif. K1	11.05	11.30	
Gary, Ind. U5	10.40	10.65	
Ind. Harb. Y1	10.40	10.65	
Irvin, Pa. U5	10.40	10.65	
Pitts., Calif. C11	11.05	11.30	
Sp. Pt., Md. B2	10.40	10.65	
Weirton, W.Va. W6	10.40	10.65	
Yorkville, O. W10	10.40	10.65	

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$8.20
Fairfield, Ala. T2	8.30
Fairless, Pa. U5	8.30
Fontana, Calif. K1	8.85
Gary, Ind. U5	8.20
GraniteCity, Ill. G4	8.30
Ind. Harbor, Ind. I-2, Y1	8.20
Irvin, Pa. U5	8.20
Niles, O. R2	8.20
Pittsburg, Calif. C11	8.85
SparrowsPoint, Md. B2	8.20
Weirton, W.Va. W6	8.20
Yorkville, O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	7.85
Gary, Ind. U5	7.85
GraniteCity, Ill. G4	7.95
Ind. Harbor, Ind. Y1	7.85
Irvin, Pa. U5	7.85
Yorkville, O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary, Ind. U5	$10.05
Irvin, Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom, W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge, Pa. A4	....	....	12.40	13.55	14.65
GraniteCity, Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor, Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield, O. E6	9.875*	11.70	12.40	13.55	14.65
Newport, Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles, O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift, Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren, O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville, O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift, Pa. U5	8.10
Mansfield, O. E6	8.10
Warren, O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths‡)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift, Pa. U5	15.70	16.30	16.80	17.85
Zanesville, O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge, Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler, Pa. A10	....	....	....	19.70	20.20	20.70
Vandergrift, Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren, O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity, Ala. R2	8.00
Aliquippa, Pa. J5	8.00
Alton, Ill. L1	8.20
Atlanta A1	8.00
Bartonville, Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville, Ind. M8	8.10
Donora, Pa. A7	8.00
Duluth A7	8.00
Fairfield, Ala. T2	8.00
Fostoria, O. (24) S1	8.10
Houston S5	8.25
Jacksonville, Fla. M8	8.35
Johnstown, Pa. B2	8.00
Joliet, Ill. A7	8.00
KansasCity, Mo. S5	8.25
Kokomo, Ind. C16	8.10
LosAngeles B3	8.95
Minnequa, Colo. C10	8.25
Monessen, Pa. P7, P16	8.00
Palmer, Mass. W12	8.30
Pittsburg, Calif. C11	8.95
Portsmouth, O. P12	8.00
Rankin, Pa. A7	8.00
S. Chicago, Ill. R2	8.00
S. SanFrancisco C10	8.95
SparrowsPoint, Md. B2	8.10
Sterling, Ill. (1) N15	8.00
Sterling, Ill. N15	8.10
Struthers, O. Y1	8.00
Waukegan, Ill. A7	8.00
Worcester, Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria, O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville, Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora, Pa. A7	12.65
Duluth A7	12.65
Johnstown, Pa. B2	13.40
KansasCity, Mo. U3	12.90
Minnequa, Colo. C10	12.775
Monessen, Pa. P7, P16	12.65
Muncie, Ind. I-7	13.60
NewHaven, Conn. A7	12.95
Palmer, Mass. W12	13.70
Pittsburg, Calif. C11	13.45
Portsmouth, O. P12	12.65
Roebling, N.J. R5	12.95
SparrowsPt., Md. B2	13.50
Struthers, O. Y1	13.40
Trenton, N.J. A7	12.95
Waukegan, Ill. A7	12.65
Worcester, Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa, Pa. J5	9.75
Alton, Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora, Pa. A7	9.75
Duluth A7	9.75
Johnstown, Pa. B2	9.75
KansasCity, Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa, Colo. C10	9.95
Monessen, Pa. P7, P16	9.75
NewHaven, Conn. A7	10.05
Palmer, Mass. W12	10.05
Pittsburg, Calif. C11	10.70
Portsmouth, O. P12	9.75
Roebling, N.J. R5	10.05
S. Chicago, Ill. R2	9.75
S. SanFrancisco C10	10.70
SparrowsPt., Md. B2	9.85
Struthers, O. Y1	9.75
Trenton, N.J. A7	10.05
Waukegan, Ill. A7	9.75
Worcester, Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa, Pa. J5	9.75
Alton, Ill. L1	9.95
Bartonville, Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora, Pa. A7	9.75
Duluth A7	9.75
Fostoria, O. S1	9.80
Johnstown, Pa. B2	9.75
KansasCity, Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury, Mass. (12) N6	10.05
Minnequa, Colo. C10	9.95
Monessen, Pa. P7, P16	9.75
Muncie, Ind. I-7	9.95
Palmer, Mass. W12	10.05
Pittsburg, Calif. C11	10.70
Portsmouth, O. P12	9.75
Roebling, N.J. R5	10.05
S. Chicago, Ill. R2	9.75
S. SanFrancisco C10	10.70
SparrowsPt., Md. B2	9.85
Struthers, O. Y1	9.75
Trenton, N.J. A7	10.05
Waukegan, Ill. A7	9.75
Worcester, Mass. A7, J4, T6	10.05

WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	16.50
Bartonville, Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville, Ind. M8	16.40
Fostoria, O. S1	16.30
Houston S5	16.55
Jacksonville, Fla. M8	16.65
Johnstown, Pa. B2	16.30
KansasCity, Mo. S5	16.55
Kokomo, Ind. C16	16.30
Minnequa, Colo. C10	16.55
Monessen, Pa. P16	16.30
Muncie, Ind. I-7	16.50
Palmer, Mass. W12	16.60
S. SanFrancisco C10	17.15
Waukegan, Ill. A7	16.30
Worcester, Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville, Ill. K4	17.15
Monessen, Pa. P16	17.15
Roebling, N.J. R5	17.65

ROPE WIRE (A)

Bartonville, Ill. K4	13.45
Buffalo W12	13.45
Fostoria, O. S1	13.45
KansasCity, Mo. U3	13.70
Johnstown, Pa. B2	13.45
Monessen, Pa. P7	13.45
Muncie, Ind. I-7	13.65
Palmer, Mass. W12	13.75
Portsmouth, O. P12	13.45
Roebling, N.J. R5	13.75
St. Louis L8	13.45
SparrowsPt., Md. B2	13.55
Struthers, O. Y1	13.45
Worcester, Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S6	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.64

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)

	An'ld Galv.	Stone Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80††
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(37)(48) N15	9.10 9.80
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50, †5c, ‡10c. §Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅝ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:
¾ in. and smaller,
6 in. and shorter +85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter + 5.0
Longer than 6 in. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches — 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa, Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Dedd. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Dedd. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 84" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown B2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. P6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.25	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.26	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	H.R. Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
306	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co., Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: 5%	Plates: Carbon Base 10%	Plates: Carbon Base 15%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.90	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.56	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.10	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.595	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.580

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	69.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. K2	89.00
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.42	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.54[a]	8.79[b]	10.87[a]	52.33	10.32[c]	8.75[d]	11.25#	15.16	9.39	8.71[e]	10.50[f]
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.54[a]	8.79[b]	10.76[a]	52.33	10.30[c]	8.64[d]	11.25#	15.05	9.00	8.47[e]	10.26[f]
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.
(a)10 Ga.; (b)20 Ga.; (c)⅛ x 1 in.; (d)¾-2½ in.; (e)¼ x 84 in.; (f)¼ x 36.
Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa.; St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $26.50-$27; barge, Brownsville, Tex., $29-$29.50.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:
Carbon, Forging Quality (net ton) $97.00
Alloy (net ton) ... 115.00

Wire Rods:
Carbon, $\frac{5}{32}$" to under ¼ in. 5.30
Carbon, ¼ in. to 47/64 in. 5.70
Alloy 6.40

Wire (carload lots) .. 8.40

Bars & Small Shapes:
Carbon, merchant quality 5.40
Carbon, special quality 5.85
Alloy 6.40

Bar Mill Bands:
Carbon 5.40
Alloy 8.05

Structural Size Angles & Zees 5.40

Plates:
Carbon 5.45

Sheets & Coils, Hot Rolled:
Carbon Sheets 5.00
Carbon Strip 5.00

Sheets & Coils, Cold Rolled:
Carbon Sheets 6.35
Carbon Strip (0.080 and lighter) 6.35
Carbon Strip (0.081 and heavier) 6.65

Sheets & Coils, Galvanized:
Standard Quality .. 6.70
Culvert Quality ... 7.00

Sheets, Porcelain Enameling 7.45

Sheets & Coils, Electrical:
Field Grade 9.00
Armature Grade ... 9.50
Electrical Grade .. 10.15

Tin Mill (Per Base Box; **Products** 100 lb basis wt)
Coke Tin Plate (1.25 lb pot yield) $10.60
Electrolytic Tin Plate (0.25 lb coating) . 9.10
Black Plate 8.30

Nails, c.l. lots, (per keg) **400 keg min.** $8.15

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags ...	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe.	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)..	59.00
Powder Flake (minus 16 plus 100 mesh) ..	29.00
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots 42.00*	
Brass, 5000-lb lots .....34.20-50.70†	
Bronze, 5000-lb lots .....52.10-56.10†	
Copper, electrolytic .. 14.25*	
Copper, reduced 14.25*	
Lead 7.50*	
Manganese, Electrolytic: Minus 50 mesh ... 43.00	
Nickel 80.60	
Nickel-Silver, 5000-lb lots .....52.70-57.10†	
Phosphor-Copper, 5000-lb lots 64.50	
Copper (atomized) 5000-lb lots 45.00-53.50	
Solder 7.00*	
Stainless Steel, 304 .. $0.89	
Stainless Steel, 316 .. $1.07	
Tin 14.00*	
Zinc, 5000-lb lots .19.20-32.40‡	
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom**
Chromium electrolytic 99.8% Cr, min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer $11.60
Mesabi nonbessemer 11.45
Old Range bessemer 11.85
Old Range nonbessemer 11.70
Open-hearth lump 12.70
High phos 11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates .....nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65% .....21.00†
Brazilian iron ore, 68.5% 22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality .....$16-$17†
Domestic, concentrates f.o.b. milling points .....16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 88.5-91.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1 .....$42.00-44.00†
48% 2.8:1 ..... 38.00-40.00†
48% no ratio ..... 29.00-31.00†

South African Transvaal

44% no ratio 19.75-21.00
48% no ratio 29.00-31.00

Turkish

48% 3:1 ..... 51.00-55.00†

Domestic

Rail nearest seller

18% 3:1 ..... 39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked $1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55% $2.25-2.40
60-65% 2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic 31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace $14.75-15.25
Connellsville, Pa., foundry 18.00-18.50

Oven Foundry Coke

Birmingham, ovens $30.35
Cincinnati, deld. 33.34
Buffalo, ovens 32.00
Detroit, ovens 32.00
Pontiac, Mich., deld. 33.95
Saginaw, Mich., deld. 35.53
Erie, Pa., ovens 32.00
Everett, Mass., ovens: New England, deld. 33.55*
Indianapolis, ovens 31.25
Ironton, Ohio, ovens 30.50
Cincinnati, deld. 33.54
Kearny, N. J., ovens 31.25
Milwaukee, ovens 32.00
Neville Island (Pittsburgh), Pa., ovens 30.75
Painesville, Ohio, ovens 32.00
Cleveland, deld. 34.19
Philadelphia, ovens 31.00
St. Louis, ovens 33.00
St. Paul, ovens 31.25
Chicago, deld. 34.68
Swedeland, Pa., ovens 31.00
Terre Haute, Ind., ovens 31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes*	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305 ...	$6.18	....	$6.13	$6.04	$6.41
Bar Size Angles	6.18	....	6.13	6.04	6.41
Structural Angles	6.03	....	5.98	5.88	6.28
I-Beams	6.03	....	5.98	5.88	6.28
Channels	6.03	....	5.98	5.88	6.28
Plates (basic bessemer)	5.95	....	5.90	5.80	6.20
Sheets, H.R.	9.00	....	8.95	8.85	9.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.90	....	9.85	9.75	10.25
Sheets, Galv. (in coils) 20 Ga., 48 in. wide ..	10.05	....	10.00	9.90	10.30
Sheets, C.R. (drawing quality)	10.00	....	10.95	10.85	11.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	....	25.28	24.99	26.68
Barbed Wire (†)	8.00	....	7.95	7.85	8.25
Merchant Bars	6.18	....	6.13	6.04	6.41
Hot-Rolled Bands	8.90	....	8.85	8.75	9.15
Wire Rods, Thomas Commercial No. 5	6.40	....	6.40	6.25	6.60
Wire Rods, O.H.	6.90	....	6.90	6.75	7.10
Bright Common Wire Nails (§)	8.40	....	8.45	8.35	8.75

*Books closed for 1959-60 shipping season. †Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene 31.00
Xylene, industrial grade 29.00
Creosote 24.00
Naphthalene, 78 deg 5.00
Toluene one deg (deld. east of Rockies) . 25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade 14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade $32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed ,bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

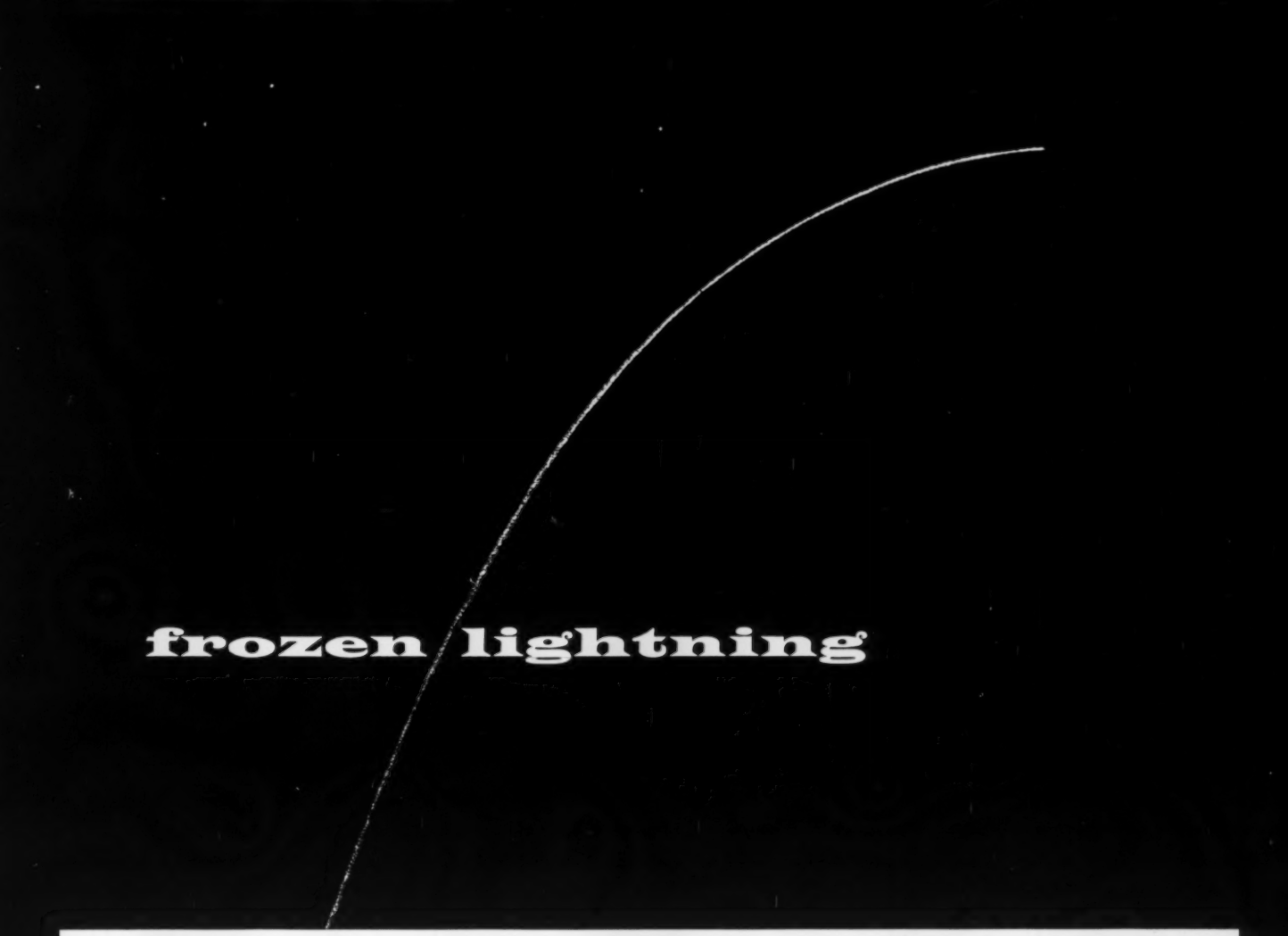
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



frozen lightning

That's what the Germans call the stratosphere trails of high altitude rockets. Soon, Mach 4-5 aircraft will be cutting frozen lightning trails across our own skies. Structural parts of hypersonic aircraft and missiles must function perfectly at temperatures too high for ordinary alloys.

The answer lies in predictable performance Carpenter alloys made by the exclusive Mel-Trol®, VacuMeltrol®, and Consumet® melting processes. Engine builders find them ideal for many critical parts. Forge shops report improved forgeability resulting in better finishes requiring far less machining . . . fewer rejects.

For the whole story about Carpenter predictable performance high temperature alloys, call your local Carpenter Representative or write: The Carpenter Steel Company, 139 W. Bern Street, Reading, Pa.

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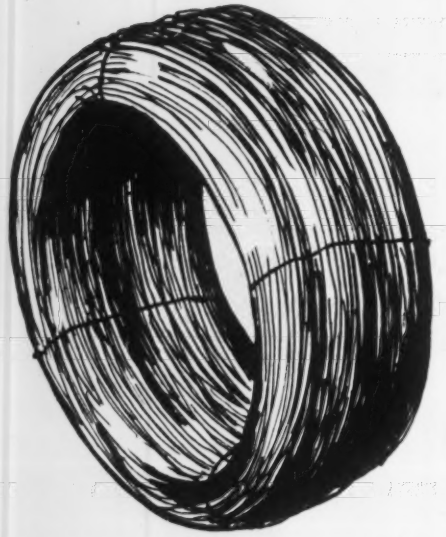
AN IMPORTANT MESSAGE FOR THE MAN WHO BUYS STEEL WIRE RODS



Ask any manufacturer who makes nails, wire mesh or barbed wire what he looks for first in buying steel wire rods and he'll tell you it's quality. For unless the rods are uniform in size and of the specified tensile strength, they're difficult to process and the result is an inferior product.

That's why nail mill owners have learned to rely on Sumitomo's wire rods made in accordance with strictest standards.

To keep up with this export demand, Sumitomo Metal has added to its present facilities another modern new wire rod mill, completely equipped with the newest, most modern machinery available.

LEADING PRODUCERS OF STEEL WIRE RODS. PIPE AND ROLLING STOCK PARTS

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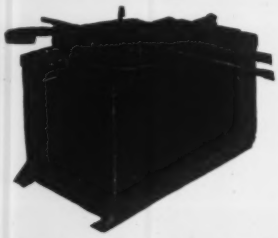
KARDONG FOUR-WAY BENDER

For Concrete Reinforcing Bars

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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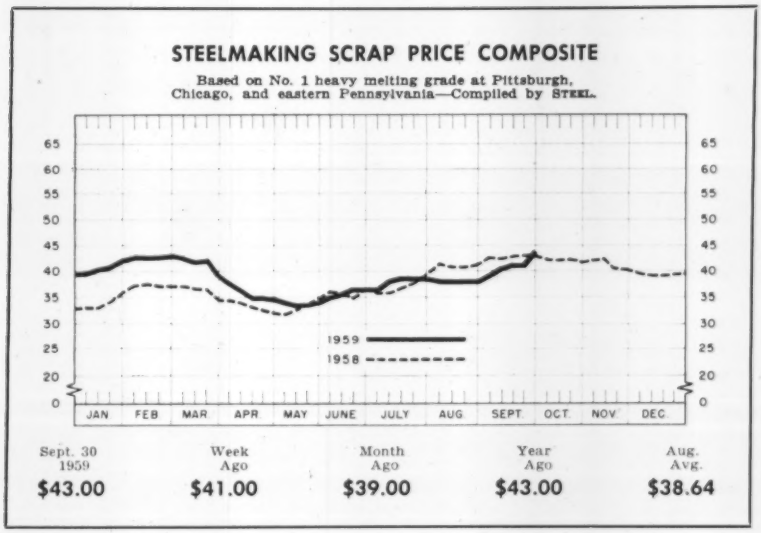

Scrap Index Soars on Buying Hopes

STEEL's composite on No. 1 heavy melting grade jumps $2 a ton to $43, strength stemming from anticipated heavy poststrike demand and continued active exports

Scrap Prices, Page 152

• **Pittsburgh**—With industrial scrap leading the parade, prices are spurting upward in the general expectation of a sudden break in the steel strike. Brokers' bids on Fisher Body bundles were surprisingly strong: $49.50 to $50.50 (vs. $45.50 a month ago). Railroad lists are expected to close $2 to $3 higher. Short shoveling turnings, currently $26, are likely to jump above $30 when steelmaking operations resume.

• **Chicago**—The prospect of Taft-Hartley being invoked in the steel strike is firming up the scrap market. Based on out-of-the-district sales and broker-dealer transactions locally, quotations are nominally about $2 higher on the leading grades. Bids on No. 1 factory bundles for October production by an auto body plant are reported at about $47.50 a ton, delivered, up $2.50 over a month ago. Railroad grades are also up $2 a ton, and foundry items have advanced $1.

• **Philadelphia** — Prices on open hearth scrap are up sharply, with No. 1 heavy melting and No. 1 busheling now quoted at $44, delivered, No. 2 heavy melting at $38, No. 1 bundles at $45, and No. 2 bundles at $29. There has been a

(*Please turn to Page* 158)

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MISSISSIPPI AGRICULTURAL AND INDUSTRIAL BOARD
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SURPRISE IN CHICAGO

You should know these surprising facts about Chicago's incomparable Drake Hotel before you schedule your next meeting—large or small...

1. While The Drake is one of America's most distinguished hostelries, it doesn't cost one cent more than other leading hotels to headquarter your meeting here.
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SUPERIOR 7-2200 • TELETYPE NO. CG1586

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Sept. 30, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 30	$43.00
Sept. 23	41.00
Aug. Avg.	38.64
Sept. 1958	42.87
Sept. 1954	29.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 dealer bundles	*45.00-46.00*
No. 2 bundles	*31.00-32.00*
No. 1 busheling	41.00-42.00
No. 1 factory bundles	*52.00-53.00*
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Cut structurals:	
2 ft and under	*49.00-50.00*
3 ft and under	*48.00-49.00*
Heavy turnings	*35.00-36.00*
Punchings & plate scrap	*50.00-51.00*
Electric furnace bundles	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*56.00-57.00*
Stove plate	*52.00-53.00*
Unstripped motor blocks	*47.00-48.00*
Clean auto cast	*62.00-63.00*
Drop broken machinery	*53.00-54.00*

Railroad Scrap

No. 1 R.R. heavy melt	46.00-47.00
Rails, 2 ft and under	*61.00-62.00*
Rails, 18 in. and under	*62.00-63.00*
Random rails	56.00-57.00
Angles, splice bars	55.00-56.00
Railroad specialties	55.00-56.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	41.00-42.00
No. 1 hvy melt., dealer	39.00-40.00
No. 2 hvy melting	36.00-37.00
No. 1 factory bundles	44.00-45.00
No. 1 dealer bundles	40.00-41.00
No. 2 bundles	26.00-27.00
No. 1 busheling, indus.	41.00-42.00
No. 1 busheling, dealer	39.00-40.00
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*23.00-24.00*
Short shovel turnings	*23.00-24.00*
Cast iron borings	*23.00-24.00*
Cut structurals, 3 ft	50.00-51.00
Punchings & plate scrap	51.00-52.00

Cast Iron Grades

No. 1 cupola	*56.00-57.00*
Stove plate	*52.00-53.00*
Unstripped motor blocks	*47.00-48.00*
Clean auot cast	*62.00-63.00*
Drop broken machinery	*62.00-63.00*

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
R.R. malleable	*63.00-64.00*
Rails, 2 ft and under	*62.00-63.00*
Rails, 18 in. and under	*63.00-64.00*
Angles, splice bars	55.00-56.00
Axles	58.00-59.00
Rails, rerolling	62.00-63.00

Stainless Steel Scrap

18-8 bundles, solids	215.00-220.00
18-8 turnings	*115.00-120.00*
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	27.00-28.00
No. 1 busheling	*45.00-46.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*27.00-28.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	*46.00-47.00*
Electric furnace bundles	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00-46.00*

CLEVELAND

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	*46.00-47.00*
No. 1 bundles	*41.00-42.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*41.00-42.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	*50.00-51.00*
Low phos. punchings & plate	*42.00-43.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	*54.00-55.00*
Charging box cast	*40.00-41.00*
Heavy breakable cast	*40.00-41.00*
Stove plate	*46.00-47.00*
Unstripped motor blocks	*38.00-39.00*
Brake shoes	*38.00-39.00*
Clean auto cast	*57.00-58.00*
Burnt cast	*39.00-40.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Rails, random lengths	54.00-55.00
Cast steel	*48.00-49.00*
No. 1 railroad cast	*57.50-58.50*
Railroad specialties	*54.00-55.00*
Angles, splice bars	*54.00-55.00*
Rails, rerolling	69.00-70.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*38.00*
No. 2 heavy melting	*35.00*
No. 1 bundles	*43.00*
No. 2 bundles	*26.00*
No. 1 busheling	*43.00*
Machine shop turnings	*18.00*
Short shovel turnings	*20.00*

Cast Iron Grades

No. 1 cupola	54.00
Charging box cast	45.00
Heavy breakable cast	44.00
Unstripped motor blocks	44.00
Clean auto cast	56.00
Stove plate	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00*
Rails, 18 in. and under	*53.00*
Rails, random lengths	*50.00*
Rails, rerolling	*63.00†*
Angles, splice bars	*50.00*

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	38.00-39.00
No. 2 bundles	24.00-25.00
No. 1 busheling	40.00-41.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plates	45.00-46.00
Structurals & plates	44.00-45.00
Electric furnace bundles	40.00-41.00
Electric furnace:	
3 ft and under	38.00-39.00
2 ft and under	39.00-40.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	41.00-42.00
No. 1 wheels	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	59.00-60.00
Rails, random lengths	46.00-47.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	*44.00*
No. 2 heavy melting	*38.00*
No. 1 bundles	*45.00*
No. 2 bundles	*29.00*
No. 1 busheling	*44.00*
Electric furnace bundles	*46.00*
Mixed borings, turning	*21.00-22.00†*
Short shovel turnings	*26.00*
Machine shop turnings	*23.00*
Heavy turnings	*35.00†*
Structurals & plates	*46.00-47.00*
Couplers, springs, wheels	*48.00*
Rail crops, 2 ft & under	*63.00*

Cast Iron Grades

No. 1 cupola	*43.00*
Heavy breakable cast	*46.00*
Drop broken machinery	52.00-53.00
Malleable	*68.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00†
Short shovel turnings	13.00-14.00†
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*47.00-48.00*
No. 1 machinery	*51.00-52.00*

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable cast	43.00-44.00
Charging box cast	43.00-44.00
Drop broken machinery	57.00-58.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00

HOUSTON

(Exporters' buying prices; f.a.s.)

No. 1 heavy melting	39.00
No. 2 heavy melting	36.00
No. 2 bundles	25.00-26.00

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos, plates & structurals	45.50-46.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable	33.00
Foundry malleable	43.00-44.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-25.50
No. 1 bundles	30.00-31.00
No. 1 busheling	30.00-31.00
Machine shop turnings	*11.00-12.00*
Short shovel turnings	*13.00-14.00*
No. 1 cast	37.00-38.00
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	38.00-38.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*36.50-37.50*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*39.50-40.50*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*35.50-36.50*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	*17.00-18.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*41.00-42.00*
Heavy breakable	*40.00-41.00*
Unstripped motor blocks	*33.00-34.00*
Charging box cast	*40.00-41.00*
Clean auto cast	*51.00-52.00*

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00-39.00*
No. 2 heavy melting	36.00*
No. 1 bundles	33.00
No. 2 bundles	20.00
Machine shop turnings	16.00
Shovel turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

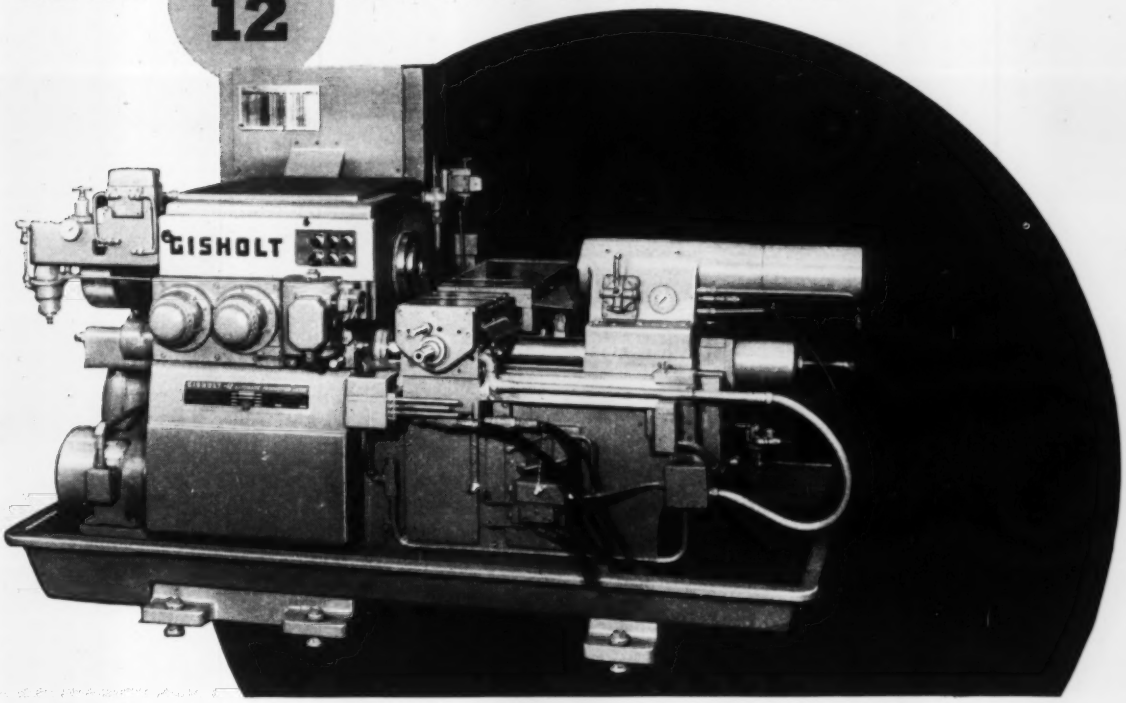
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

*Delivered to docks.
†Nominal.
‡F.o.b. Hamilton, Ont.

GISHOLT NUMBER 12 AUTOMATIC CHUCKING LATHE



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Steel Key to 4th Quarter

Nonferrous metals companies are beginning to feel the pinch of the steel dispute. The squeeze hasn't become acute but will if the walkout lasts much longer

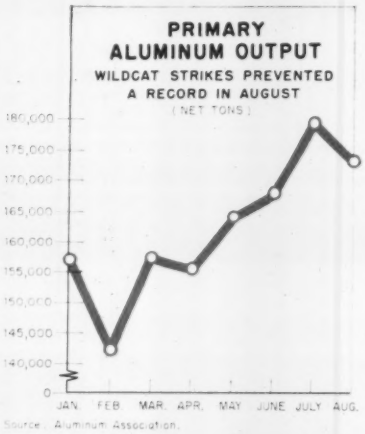
Nonferrous Metal Prices, Pages 156 & 157

STEEL negotiations hold the key to how well the nonferrous industry fares in the fourth quarter. If the strike ends soon, it will be a period of heavy sales, rising prices, and in some cases, more demand than supply. A protracted steel dispute—one dragging beyond the middle of November—will bring the nonferrous industry grinding to a halt as its major customers have to shut down or sharply curtail operations.

Here's the capsulized outlook for six metals during the next three months:

• **Copper**—There's more demand than supply, but that's because all but about 13 per cent of the domestic industry's capacity has been closed down by its own strike. The industry won't have any trouble disposing of the available copper throughout the quarter. In fact, a move may develop to gain release of the material in the government's Defense Production Act inventory if the pinch becomes acute. Customers had pretty well stocked up with metal bought earlier in the year, but inventories are being worked off at a rapid rate which may indicate a pinch in supplies when the strikes end. Through last week, there were no signs of a break in the copper stalemate. Consensus: No general settlement until after the steel deadlock ends. If prices move at all, they will probably go up.

• **Aluminum** — If the steel strike ends soon, fourth quarter shipments could be the best on record. A steel strike lasting a few more weeks would seriously hurt the industry. Business is sliding as users begin to curtail operations because of a lack of steel, and there's a real danger of layoffs and cutbacks in production (initially at fabrication plants) if the trouble continues. Many users are living off their swollen inventories and holding up on more buying until the labor picture becomes less cloudy. Since the union and aluminum companies have lived under a truce this long, it seems unlikely we will see an industrywide strike. You'll see an



across-the-board price rise but probably not until after a new contract has been signed.

• **Lead**—The steel dispute hasn't had much influence on lead sales and probably won't unless it continues to the point where the entire economy is slowed down. Lead's biggest customer, the battery industry, is going strong which lends stability to an otherwise mediocre market. Demand is just about good enough to take the 50 per cent of the country's refined output not shut down by strikes at domestic smelters. Outlook: Probably a little better quarter than the third with price stability.

• **Zinc**—Despite the loss of most of its major customer (the galvanizing industry) since steel went on strike, zinc sales have been strong. Effects of the steel strike, such as requests to defer shipments of special high grade, are beginning to be felt, and this will become more severe each day the dispute lasts. If the strike ends soon, the fourth quarter will be excellent. There could easily be more demand than supply and another price hike of 0.5 to 1 cent a pound.

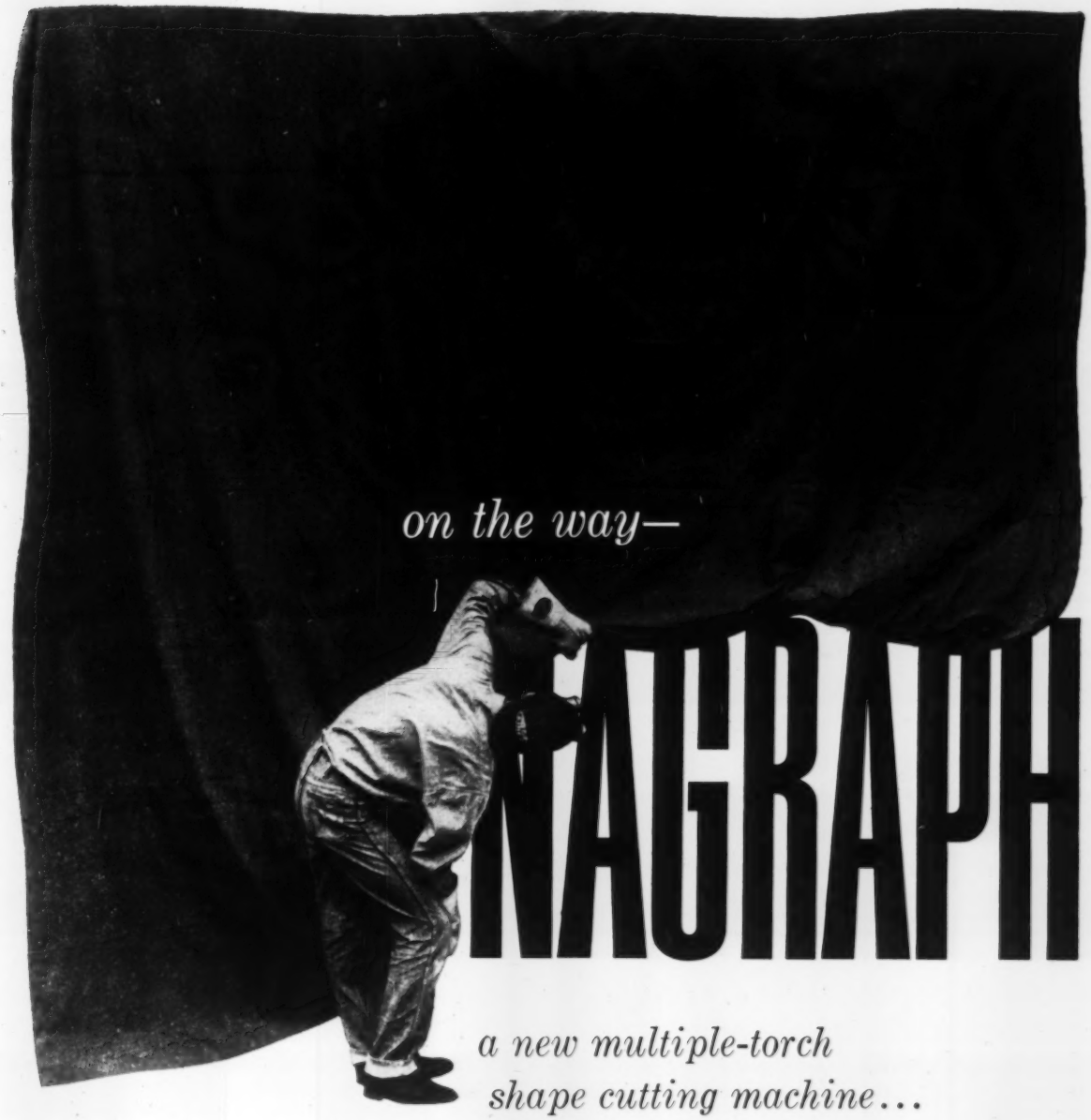
• **Nickel**—The metal had an excellent second quarter, did about as well in the third, and improvement is expected in the next three months. The industry has recently done a sizable business with several strike-bound steel firms. Orders from overseas users are way up. The steel strike hasn't hurt sales yet and won't for some time. No production cutbacks are expected; prices will remain at present levels throughout the quarter.

• **Magnesium** — The steel strike hasn't bothered magnesium sales to date and won't until the general economy is badly affected. The fourth quarter outlook (if the steel issue is settled shortly): Sales will be slightly under the second and third quarter levels.

NONFERROUS PRICE RECORD

	Sept. 30 Price	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.00–33.00	Aug. 31, 1959	30.00	30.010	30.048	26.428
Lead	12.80	Aug. 24, 1959	11.80	12.069	11.800	10.730
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.75	Sept. 30, 1959	102.50	102.333	102.298	94.120
Zinc	12.00	Sept. 21, 1959	11.00	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.



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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60, 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00-31.50 deld.; custom smelters, 33.00; lake, 31.50 deld.; fire refined, 29.75-31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $223-225 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.9 in. diam., 50-4999 lb, $3.15-11.00 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.00; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.75.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 12.00; brass special, 12.25; intermediate, 12.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 13.25; special high grade, 13.50 deld. Diecasting alloy ingot No. 3, 15.25; No. 2, 15.75; No. 5, 15.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.50; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass, No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 36.85; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.85
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Thickness Plate	0.250-3 in. Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.530	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 10.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 23.50-23.75; No. 2 heavy copper and wire, 21.50-21.75; light copper, 19.50-19.75; No. 1 composition red brass, 18.50-18.75; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	54.63b	52.86c	....	55.82
Yellow Brass	48.32	33.86d	48.86	51.73
Low Brass, 80%	51.28	51.22	51.82	54.59
Red Brass, 85%	52.33	52.27	52.87	55.64
Com. Bronze, 90%	53.92	53.86	54.46	56.98
Manganese Bronze	56.62	50.28	60.72	....
Muntz Metal	50.95	46.21	....	....
Naval Brass	52.90	46.71	59.46	56.31
Silicon Bronze	60.67	59.86	60.21	78.35
Nickel Silver, 10%	63.88	66.21	66.21	....
Phos. Bronze	75.34	75.84	75.84	77.02

SCRAP ALLOWANCES e (Based on copper at 31.50c)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	27.500	27.500	26.750
Yellow Brass	20.750	19.875	18.875
Low Brass, 80%	23.250	23.000	22.500
Red Brass, 85%	24.250	24.000	23.500
Com. Bronze, 90%	25.250	25.000	24.500
Manganese Bronze	19.375	19.125	18.500
Muntz Metal	19.375	19.125	18.625
Naval Brass	19.250	19.000	18.500
Silicon Bronze	27.000	26.750	26.000
Nickel Silver, 10%	25.625	25.375	12.810
Phos. Bronze	28.625	28.375	27.375

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.50-17.75; new brass clippings, 15.50-16.00; light brass, 12.00-12.50; heavy yellow brass, 13.00-13.50; new brass rod ends, 13.50-14.00; auto radiators, unsweated, 14.00-14.50; cocks and faucets, 14.75-15.25; brass pipe, 15.00-15.50.

Lead: Soft scrap lead, 8.75-9.25; battery plates, 4.50-4.75; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.00-32.00; old sheets 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.50-13.00.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.75-17.25; segregated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.00; light copper 21.00; refinery brass (60% copper) dry copper content, 23.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.00; light copper, 22.00; No. 1 composition borings, 21.50; No. 1 composition solids, 22.00; heavy yellow brass solids, 16.00; yellow brass turnings, 15.00; radiators, 16.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 41.00, 2000-5000 lb lots; cast, 43.50, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 19.50; flat tops, 19.50; flats, 22.25; ovals, 21.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.35; 2000-5900 lb, 13.35; 6000-11,900 lb, 13.10; 12,000-22,900 lb, 12.85; 23,000 lb or more, 12.35.

Nickel Chloride, 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

Special Clearance By Manufacturer

90 Day Old Thomas Quality Steel Angles, Channels, Round Bars, Flats from Belgium, as follows:

ANGLES	Wght. in lbs.
1½" x 1½" x 3/16" x 21'0"	220,772
1½" x 1½" x 3/16" x 23'0"	279,574
2½" x 2½" x 3/16" x 20'0"	175,080
CHANNELS	
3" x 5.0 Lbs. per ft. x 20'0"	15,300
4" x 5.4 Lbs. per ft. x 20'0"	164,160
Mild Steel Merchant Bars-Round	
1" x 20'0"	110,644
¾" x 20'0"	564,860
¾" x 25'6"	201,730
⅝" x 20'0"	518,024
⅝" x 25'0"	273,234
Mild Steel Hot Rolled Sheets	
⅛" x 22" x 114"	57,076
⅛" x 22" x 57"	1,650
⅛" x 44" x 114"	78,000
⅛" x 36" x 133"	1,320
TOTAL:	2,660,874

This steel now located in Puerto Rico. Interested buyers are invited to contact us while quantities last.

Box SM 1091, 125 West 41st., New York 36, N. Y.

FOR SALE

1	pc.—30"	WF	@	116#	15'7"
1	pc.—33"	WF	@	152#	18'3"
1	pc.—33"	WF	@	240#	34'8"
1	pc.—36"	WF	@	194#	20'3"
1	pc.—36"	WF	@	194#	21'4"
1	pc.—36"	WF	@	245#	34'0"
1	pc.—36"	WF	@	245#	35'6"
1	pc.—36"	WF	@	245#	51'0"
1	pc.—36"	WF	@	245#	85'2½"
1	pc.—36"	WF	@	260#	87'7"
1	pc.—36"	WF	@	260#	20'8"
1	pc.—36"	WF	@	260#	43'8"
1	pc.—36"	WF	@	260#	42'9"
1	pc.—36"	WF	@	260#	39'8"

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CLASSIFIED

Help Wanted

A centrally located steel plant is in need of a man with Hot and Cold Strip experience and some melting, with ability to accept supervisory responsibilities with opportunity for later promotion to top level management. Prefer man age 50 years or under. All replies will be kept confidential and should include complete information concerning age, educational background, employment history and salary expected. Reply Box 792, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Well established modern machine shop has open time in Power Press Dept. (Max. cap. 300 tons). Complete tool & die facilities available. Written inquiries to A. V. Specialty Corp., 632 Center Ave., Mamaroneck, N. Y.

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HOW TO BEAT THE HEAT

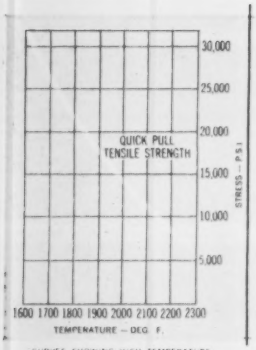
for strong high alloy requirements in the 1,800° to 2,300° F range!

DURALOY HOM*

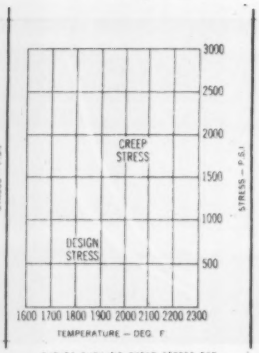
*Covered by U.S. Patents

casting alloy

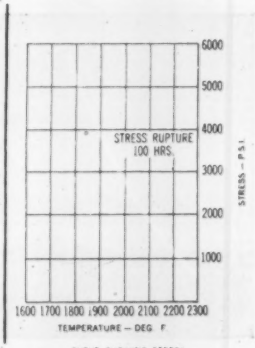
Duraloy "HOM" is a special high nickel alloy developed to produce castings that meet high temperature requirements, especially when castings are subject to oxidizing atmospheres.



CURVES SHOWING HIGH TEMPERATURE SHORT TIME TENSILE STRENGTH OF DURALOY HOM



CURVES SHOWING CREEP STRESS FOR CREEP RATE OF 1% IN 10,000 HOURS AND RECOMMENDED DESIGN STRESS FOR DURALOY HOM



CURVE SHOWING STRESS TO RUPTURE AT 100 HOURS FOR DURALOY HOM

Castings of DURALOY "HOM" are now being produced by our three methods: static, centrifugal and shell molded. Write today for additional information on this versatile new alloy.

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CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

(Concluded from Page 151)

domestic buy, but the strong prices largely reflect continued heavy export demand.

• **New York** — Indicative of the strong export market, scrap brokers have advanced their buying prices $1 a ton on the major open hearth grades. They are offering $32-$33 for No. 1 heavy melting and No. 1 bundles, $29-$30 for No. 2 heavy melting, and $21-$22 for No. 2 bundles. No. 1 cupola cast is up $2 at $38-$39, under strong demand pressure from district foundries.

• **Cleveland**—Despite the absence of steel mill demand for scrap, the market is strong, and prices are up $1 to $3 a ton on the prime grades as dealers and brokers anticipate a strong poststrike buying movement. Bids on early automotive lists are up $2 to $4 a ton over a month ago.

• **Detroit**—The market is unsettled. Talk of impending action in the steel labor impasse makes dealers and brokers cautious in their bidding on the new auto lists.

• **Buffalo**—Cast scrap prices have advanced $1 here as a result of new purchases by large foundries. Cupola cast is now quoted at $48, and No. 1 machinery cast at $51-$52.

• **Cincinnati** — Industrial lists are expected to point the way for prices over the next week or so. Increases of $2 to $3 a ton were indicated by early closings.

• **Houston**—Premium grades are in short supply, and the market is bullish. Regional exporters are having difficulty filling commitments for No. 1 heavy melting steel.

• **St. Louis**—Higher prices on the open hearth and railroad grades reflect developing strength in the market. All open hearth grades are up $2 to $3 a ton, while the railroad items are quoted $1.50 to $4 a ton higher.

• **Birmingham**—Scrap is moving slowly in this area, but prices are firm. Foundries are buying sparingly.

• **San Francisco** — Prices on the steel grades are firm, and there's talk in the market of an advance when the strike is settled.

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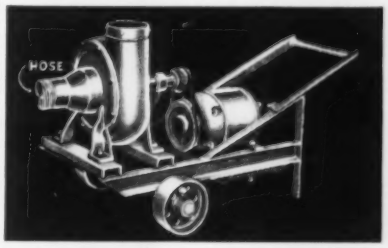
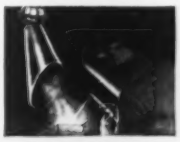
HOUSTON 2 LOS ANGELES 5 ATLANTA 8

RUEMELIN *Portable*
Fume Collector

Removes gas, smoke and heat from welding operations. Recommended for ventilation of tank interiors, manholes, vats, airplane fuselages or for blowing fresh air into inaccessible places.



• Collector is equipped with a power unit capable of handling up to 35 ft. of steel tubing. Mounted on rubber tired wheels for ease of handling. Models also available mounted on steel legs for hose operation in a complete 360 degree circle.



• This view shows inlet hood picking up welding smoke. Operator breathing zone protected.

WRITE FOR DETAILED INFORMATION.
RUEMELIN MFG. CO.
3882 N. Palmer St., Milwaukee 12, Wis. U.S.A.
Manufacturers and Engineers • Sand Blast and Dust Collecting Equipment • Welding Fume Collectors

A7-9355-1/6

It's 148°F to 180°F in this Kiln! Yet AO Head-to-Foot Protection Permits Worker to take Searing Kiln Heat — and Do His Job!

Thanks to American Optical's new Thermalair Respirator and Aluminized Clothing, this man can now do a productive job in temperatures which formerly would have felled him. Application above is a kiln which man enters 4 or 5 times a day for about ten minutes to check moisture content of lumber. The safety director commented: "W[illegible] tried going in without the respirator and couldn't get past the door."

The AO Thermalair Respirator (the only one of its kind) protects against heat *up to 300°F.* It was developed for use in ovens, kilns, furnaces and dryers when workers must enter these areas for product control, repairs and maintenance. *Here's how the respirator works:* Using the heat exchanger principle, as wearer inhales, heat is removed from incoming air and temporarily stored in the cartridge (not in wearer's respiratory passages). As wearer exhales, the stored heat is expelled from cartridge to the outside air. QUICK FACTS: A great health, time and money saver . . . permits freedom of work movement (no bulky equipment) . . . protects in sub-freezing as well as excessively hot atmospheres.

AO Aluminized Clothing does the rest of the heat protection job — and does it comfortably. The material reflects 90% of radiant heat — and weighs only 50% as much as regular asbestos. It also has superior abrasion resistance to plain asbestos (or duck) with longer safe life. AO Aluminized Clothing is available in a complete line of clothing and gloves including jackets, coats, pants, chaps, aprons, spats, leggings, overalls and hoods.

NOTE: The Hood and Aluminized Window on wearer in photo were developed by AO especially.

Always insist on ® Trademarked Safety Products

American Optical
COMPANY
SAFETY PRODUCTS DIVISION
SOUTHBRIDGE, MASSACHUSETTS
Safety Service Centers in Principal Cities

Your Nearest AO Safety Products Representative can Supply You.

New 50 hp. Super "T" V★S Control Units compared with 50 hp. old style drive on Reliance production line.

New Reliance SUPER 'T' V★S DRIVES put more power into a 35% smaller package

You can increase usable work space and improve machine performance with the New Reliance Super 'T' V★S Drive. More than just a compact drive, the Super 'T' packs extra punch into its new small size.

Like the Super 'T' Drive Motor, the new control unit uses Class B insulation, and will take repeated 100% overloads of one minute duration. These features plus special control apparatus design and the Super 'T' D-c. Drive Motor actually put more power in less space.

This systematic design balance of power unit, drive motor and controls forms a fast functioning drive to provide a wide range of variable operating speeds from a-c. circuits.

40 – 150 hp. Super 'T' V★S available for immediate delivery. Contact your Reliance Sales Engineer for delivery schedules of the complete line, 1 – 350 hp.

B-1628

Product of the Reliance Electric and Engineering Company, manufacturers of a-c. motors, Master Gearmotors, Reeves Drives, Super 'T' D-c. Motors, generators, controls and engineered drive systems.

RELIANCE ELECTRIC AND ENGINEERING CO.

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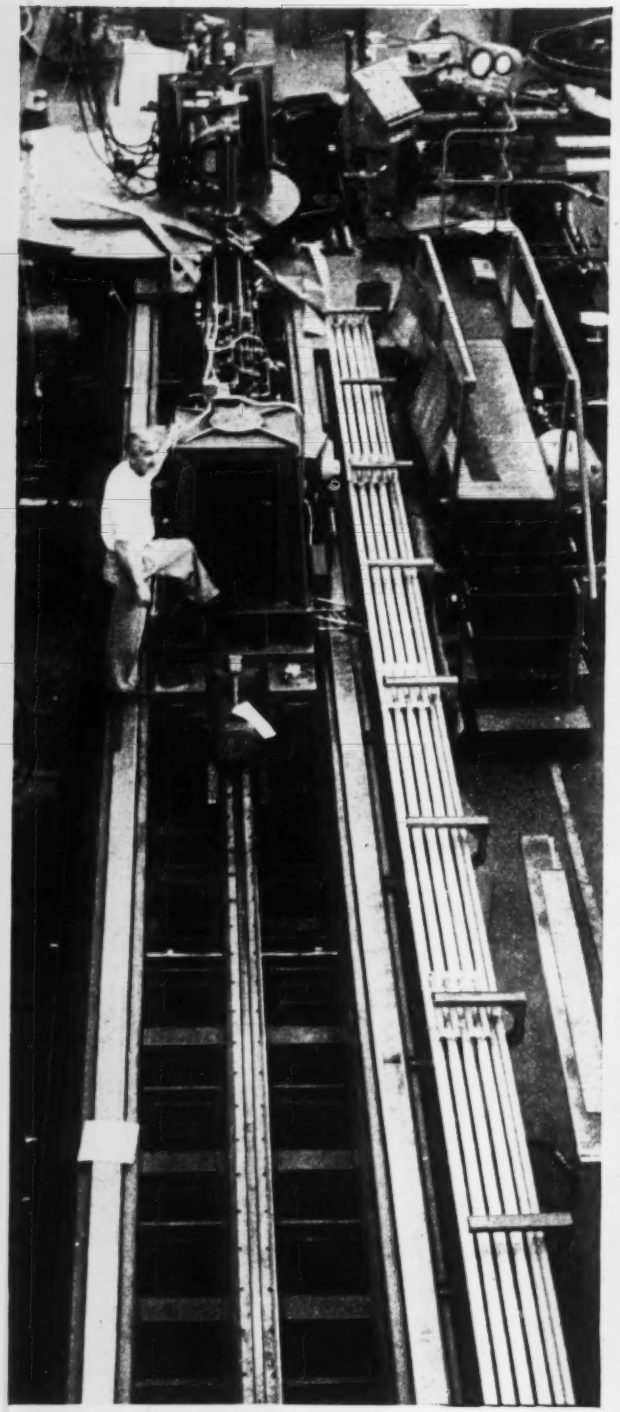


How Cyril Bath reduced friction, increased accuracy on this 50-ton radial draw former

THIS new Cyril Bath radial draw former produces contoured metal parts in sections up to 360° for industrial, aircraft and missile applications. Because the exacting work is done at low speeds, smooth starting and running are vitally important. And to *assure* smoother, more accurate operations, Cyril Bath Co. engineers switched to Timken® *tapered* roller bearings—22 in all—on the table, carriage and drives. Here's why:

1) *Timken bearings virtually eliminate friction.* They're geometrically designed and precision-manufactured to roll true. They reduce starting friction, roll smoothly and maintain their precision longer.

2) *Timken bearings have extra toughness* because their steel is nickel-rich.

Whether you build or buy machines, you get *extra* benefits with Timken bearings—benefits that come from the Timken Company's leadership in tapered roller bearing design and in engineering service. For example, we maintain the most modern bearing research center—use testing equipment you won't find anywhere else in the bearing industry. To be sure of getting top bearing value in your machines be sure they're Timken bearing-equipped. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

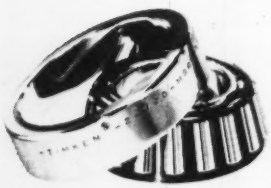
WHEN YOU BUY TIMKEN® BEARINGS YOU GET...

1. Quality you can take for granted **2.** Service you can't get anywhere else **3.** The best-known name in bearings **4.** The pace setter in lower bearing costs

BETTER-NESS rolls on

TIMKEN®

tapered roller bearings



First in bearings for 60 years